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AND
COMMERCIAL GEOGRAPHY
BY
CHARLES MORRIS

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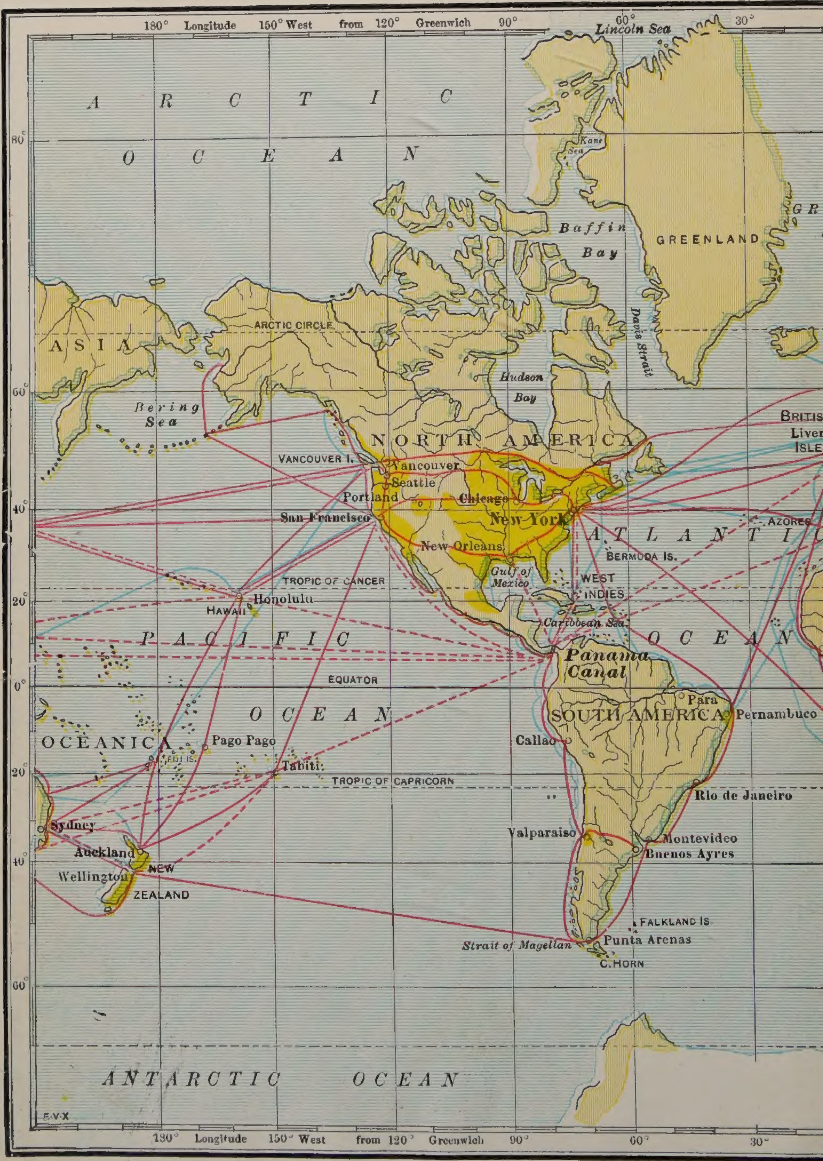
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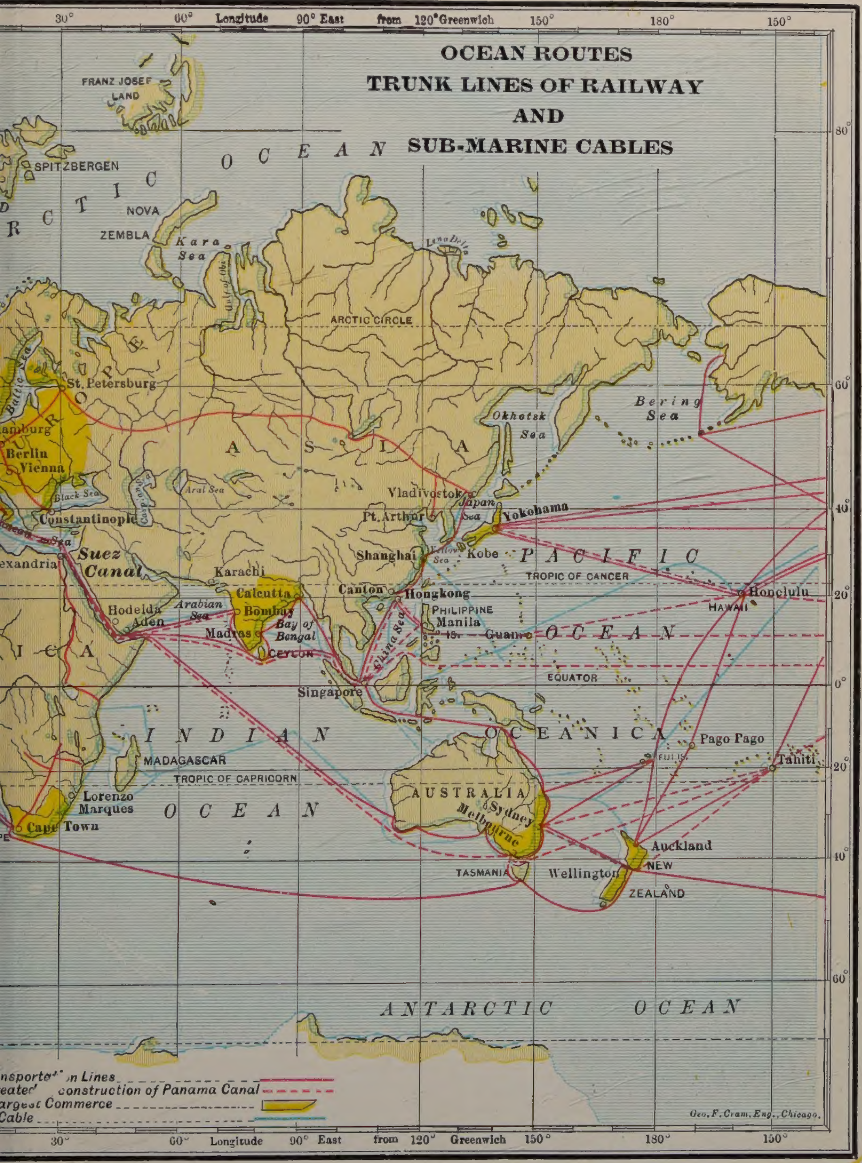

OCEAN ROUTES TRUNK LINES OF RAILWAY AND SUB-MARINE CABLES

Industrial and Commercial Geography

FOR USE IN SCHOOLS

BY

CHARLES MORRIS

Author of a Series of U. S. Histories, History of the World, Historical Tales,
Home Life in All Lands, etc.

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PREFACE.

GEOGRAPHY is one of the most important subjects dealt with in schools. To gain a knowledge of the earth we dwell upon, its bodies of land and water, its mountains and plains, and the various other features of its surface is essential to any true education. It is equally important to become familiar with its political divisions and its astronomical relations, to learn, in fact, all we can about the earth as a member of the solar system and a place of residence for the human race.

In these particulars we have the essence of geography as formerly taught. But they do not constitute the whole of geography as now considered. Of late years it has been found desirable to extend the scope of geographical study so as to include the animals and plants useful to man, the metals and minerals of the rocks, the industries by which these are made available for use, and the methods by which they are distributed to those who need them. Every section of the earth has its own plants, animals, and minerals; its own methods of manufacture and commerce; its own workshops and market places in which goods are made and sold; its own draught animals, wagons, railroads, ships, and other means for the carriage of goods from the place of making to the place of using. And the arts of industry and commerce in our days have made such wonderful progress as to constitute a new geography, a knowledge of which is necessary to every well-informed person.

The present work deals with this subject. It seeks to show what Nature has done in fitting the various regions of the earth for human habitation, and what man has done in making it better fitted. It attempts to point out why the great cities of the earth have grown up where they are, and why some of them have become active centres of manufacture and others of commerce; why some lands are thickly and some thinly settled, and what are the products and industries to which the various nations owe their prosperity.

In doing this, especial attention has been given to our own country, the United States of America, since it means more to us than does any other country of the world, and it is very desirable that we should gain a just conception of the causes of its growth and greatness. Therefore much has been said about the great grain products with which it has helped to feed the world, the cotton with which it has gone far to clothe the world, its vast forests and their uses, its multitude of food animals, its mountains of coal and iron, and all the things which have helped to make its people prosperous and happy. To these is added the story of its active workshops and the great variety of useful articles made in them; of the railroads which carry these goods over the country, and the ships that take them to foreign lands and bring us back other needful goods; of the development of the cities in which hosts of people are engaged in these labors; of the work of the farmers in the fields, the miners in the rocks, and the artisans in the great hives of industry.

The industries and products of other countries are also dealt with, but not at equal length, since the work of man's hands in all countries is much alike and there is no need to repeat the story. But in nearly every country some special industry or product may be found and under the head of each country is given an account of what it stands for in the great working community of mankind.

Every effort has been taken to adapt this work to school purposes, as a text-book of commercial geography and as a means of gaining a fair idea of what man is doing upon the earth. It deals with the work of his hands and of his mind and does its utmost to show what a rich old world man has made of the earth that has been given him as a place of residence, and to what an extent he has improved upon the splendid provision made for him by Nature.

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INDUSTRIAL AND COMMERCIAL GEOGRAPHY.

CHAPTER I.

GENERAL PRINCIPLES OF INDUSTRY AND COMMERCE.

The Scope of Geography.—In the study of geography—that is, in seeking a knowledge of the earth on which we live—we have usually two things to deal with. One of these is the aspect of the earth as Nature made it. The other is its aspect as man has modified it. In the first we have to do with Physical Geography, and must learn the names and shapes of oceans, continents, mountains, plains, rivers, and all the other variations of the surface. In the second we have to do with Political Geography, and must study the boundaries of countries, the names and locations of cities and villages and of all the other divisions of the surface made by man.

Industrial Conditions.—This is not all that is needed. To get a full idea of geography we need to learn much more. Man requires food, clothing, and a great many other things, and these he must obtain by the use of his own hands in cultivating the soil or working in shops and factories. It is important to all of us to have a knowledge of these things, the plants and animals which supply us with food, the fibres of which our clothing is made, the woods and metals so useful in many ways.

Trade and Commerce.—There is still more to be learned. Men are constantly exchanging these articles with one another. In its simplest aspect, when these are passed directly from hand to hand, we call this trade. In its fuller aspect, when they are carried over land and sea, for the use of far-off peoples, we call it commerce.

In our days industry and commerce, with the processes of manufacture and of transportation which they require, have grown and spread in a thousand directions, and a new phase of earth-study has arisen, the Geography of Industry and Commerce. This is a subject of the utmost importance, and one with which everybody should be familiar.

The Industrial Arts.—No one can pretend to have a fair idea of the world he lives in until he knows a great deal about what is grown on its soil, what is mined from its rocks, what is yielded by its waters, and what is made in its workshops. He also needs to learn how these things are carried to the places where they are to be used, and this leads to a study of the arts of transportation. This began with the carrying of goods on the backs of men and animals, and has gone on to the development of great railroad and steamship lines, which convey vast quantities of freight.

Commerce in House and Street.—None of us can pass a day of our lives without learning something about the methods of commerce. On the breakfast table food is placed before us, some of which may have come from distant parts of our own country, and some from far-off foreign lands. The plates and other dishes on which it is served were made, perhaps, in workshops of cities hundreds or thousands of miles away. The tables and chairs may have come from Indiana, the carpets from Philadelphia, the mantel ornaments from France or Italy. On going into the street we see many indications of this transport of goods. There are stores crowded with useful materials, many of them made in distant countries, wagons and drays carrying them from place to place, men and women engaged in buying and selling these useful articles.

When we reach the wharves or the railroad stations we gain larger ideas of commerce. At the wharves great ships may be seen, on which goods are being loaded for ocean voyages, or other goods brought from distant lands are being unloaded. At the stations we perceive long trains of cars filled with the products of fields and factories of our own land. And thus as we go on through the day, and also through the night, if we have kept our eyes open and our minds busy we must have learned that commerce is one of the most important branches of human activity and geographical study.

Handling Heavy Freight on the Pennsylvania Railroad.

Our Life's Work.—We not only see all this, but we take part in it. There are few of us who do not join in the world's work. Our home may be on the farm, where we help in the planting of wheat or corn, or the feeding of cattle and sheep. Others find work to do in shops and factories, or take part in the sale and delivery of goods. The work of some keeps them at home; that of others takes them far from home. Thus production and commerce stretch around us like two great chains, and if we wish to live upon the earth we cannot help taking some part in the making or moving of goods; even if we are so idle as to do nothing but eat, drink, and wear the things brought us by train or ship, we at least aid in creating a demand for these articles.

THE OCEAN STEAMER OF TO-DAY.

From Savage to Civilized Trade.—What has been said goes to show that commerce is the mainstay of civilization. Even the uncivilized and savage races take some part in it. There are few tribes so low that they do not trade with one another. It may be only to exchange a stone hammer or a bow and arrow for a supply of meat or fruit. Or we may find the fishermen, hunters and farmers of primitive villages exchanging with one another their flesh, fish and plant-food. Among civilized peoples a great variety of things are grown or made, and every one of us is ready to exchange the thing which we produce for some of the thousand things which other men produce.

A Circle of Exchange.—Some parts of the earth are fitted to produce certain special things and some to produce other things. None of us can produce all the things we need, unless our wants are very simple indeed; and we are usually glad enough to exchange the things we have for the things we want, or to sell them for money which enables us to buy other things. For instance, the cattle and sheep-raisers of the western plains must buy wheat for their bread from the farmers. These, in turn, need to buy ploughs and harvesting machines from the manufacturers. The latter have to buy iron and wood from the miners and foresters. These need to buy meat from the cattle-raisers. Thus the circle of trade is complete. The money used as a go-between comes back to the place from which it started. Its part has been to aid in the exchange of goods around the circle. And in the broad range of commerce hundreds of such circles exist, most of them much wider than the one we have given.

Home Production.—We, of course, do not send across the wide oceans to lands thousands of miles away for things we can produce as well at home, and thus save the cost of freight. Any country with a fertile soil and good climate can grow in its fields most of the food-stuffs its people want. This is the case with our own country. We buy from our own farmers and herders forty times as much food as we get from foreign lands. It is the same way abroad. Each country of Europe raises much the greater part of the food its people need,—except England, where the people are very largely engaged in trade and manufacture and buy most of their food abroad.

Foreign Trade.—Yet many nations need things which the soil of their own country is not fitted to produce. Indian-corn, for instance, the most abundant farm product of the

United States, will not ripen in the British Islands or Northern Europe, and much is sent there for cattle-food. Much of the wheat of the United States is also exported to Europe. On the other hand, this country gets great part of its sugar, and all of its coffee, tea and spices, from foreign lands. Thus commerce goes steadily on, and the needs of mankind help to bind the various nations together into one great family.

Workshop Products.—While most countries produce nearly all the food they consume, this is not the case with the products of their workshops, the manufactured goods they make and need. Great Britain, for example, has long been the most active of manufacturing nations, and has supplied many millions of people with goods they could not make for themselves. Germany and the United States have of late years become very active in work of this kind, and there are some nations which have just come actively into this field of labor, such as Japan.

The Development of Manufacture.—In former times there was very little commerce either in food-stuffs or manufactured goods, almost none if we compare it with the commerce we now have. Every village and town had its own little shops in which the few things needed by its people were made. Women at home spun the cloth and made the clothes for the men at work in the fields, and these hammered out their own scythes and ploughshares. The days of great workshops do not go back much more than a century.

We find these to-day in certain countries where the soil is too poor to produce much food, and where the people have to make articles that other nations want and which they can exchange for food. This is the case with New England, where so little can be grown on the thin soil that many of the people long ago got much of their food by fishing in the seas, and where now great mills are to be seen in which cotton and woolen cloth, shoes, and a multitude of other things are made for sale all over the country and in distant lands.

Conditions of Trade.—The principle of trade is that one thing shall be exchanged for another. If any man goes on paying out money for everything he needs, and does nothing to bring back money, the chance is that he will soon feel the bottom of his purse. It is the same with nations. If one of these buys much from foreign countries and has nothing to sell them in exchange, its money chests will in time be empty and its foreign commerce come to an end. Such was the case in old times with the commerce between Europe and Asia. The goods which Europe bought from Asia had to be paid for with gold and silver, since Asia bought very little from Europe. Such a one-sided commerce could never become large, for Europe did not have the money to spare, and Asia did not want its goods.

Ceylon Bullock Wagons.

Modes of Transportation.—Commerce in old times was kept small also on account of the poor means of transportation. Probably the first method of carriage was on the backs of men—which are still used for this purpose in some parts of the world. Then goods were carried on mules, horses, and camels, or were sent in clumsy carts over wretched roads. There was little ocean traffic, for vessels were small and did not dare to go far out of sight of land.

Century after century commerce grew more active. Better roads were made and stronger bridges were built. The discovery of the mariners' compass enabled ships to sail far out to sea. Finally steam-power was brought into use, and the railroad and steamship came to the aid of the merchant. Also in old times merchants were often robbed of their goods by brigands on land and pirates at sea. They are now safe from all this. As a result, commerce has grown enormously, and vast quantities of goods are now annually sent to great distances from their place of production. Thus in our day the world fairly hums with industry; never before were men kept so busily engaged, or at so many kinds of work, and never were they so well paid for their labor.

CHAPTER II.

ADAPTATION OF THE EARTH TO MAN'S RESIDENCE.

The Earth's Surface.—When we think of the great size of the earth and the vast extent of its surface,—said to be about 197,000,000 square miles in area,—and then think of the little space each of us needs to live on, we might imagine that our planet was large enough to hold immense multitudes of human beings. But a look at the map and a little study of geography teach us that only a minor fraction of the whole is fitted for man's residence.

We see that great oceans surround the much smaller continents, and may easily learn that the waters of these oceans cover about 143,300,000 square miles, so that the land surface is little more than 50,000,000 square miles in extent—less than two-sevenths of the whole. And when we come to look into the matter more fully we find that many large sections of this land area are poorly fitted for the needs of man, so that he has much less than 50,000,000 square miles to dwell upon.

Where Man Cannot Dwell.—In many regions the land surface is ridged and wrinkled like a rough-skinned orange, great mountain ranges rising high into the air, on which few food-plants can be grown, and on which only the hardiest of men can dwell. In other regions, as in parts of Africa and Asia, vast sand deserts spread out, on which men can live only by travelling about and carrying their food with them.

If we should seek the northern parts of the great continents of America and Asia, we would find ourselves in bleak, icy regions, inhabited by only a few savages, clad in the skins of animals and wandering far around in search of the little food to be found. Then, if we made our way to the warmest regions of the earth, we should find like results from other causes. Thus in Brazil and Central Africa are forests of immense size, so thick and dense that a mere handful of half-naked savages can find the means of life in their sunless depths.

Regions of Thin Population.—On these mountains, in these deserts, on these frozen polar regions, and within these steaming tropical forests few men can live. Vegetable food is largely or wholly wanting, and animal food hard to find. In other regions there are great tracts of land where the rainfall is so scanty that edible plants will not grow. We call them arid regions instead of deserts, but in some respects they are worse, for deserts have fertile oases here and there where food can be obtained; but the arid lands have no such fertile spots and produce nothing which man can eat. There are great stretches of such arid lands in the western part of our own country.

Ruins of the Cliff-Dwellers' Homes.

Where there is a little more rain grasses will grow and cattle and sheep can find food. But few men are needed to take care of these animals, and thus the population is not large. In the great grazing steppes of Mongolia, in Asia, there are only wandering tribes of cattle-keepers dwelling in tents and living on meat and milk. Something a little like this is to be seen in the semi-arid region of our own western country, the realm of the cowboy and the cattle-king. In addition, we may speak of the forest regions of the temperate zones, covering wide tracts of land, much of which might be used for farms if man did not need wood as much as he does farm products.

Range of Human Habitation.—We have said that the whole land surface of the earth is a little more than 50,000,000 square miles in area. But if we consider the great outspread of mountain ranges, deserts, ice-clad and arid lands, and forest regions, it will be seen that a large part of this is very poorly fitted for human habitation. The tent-dwelling cattle-keepers, the forest savages, the tribes of the realm of ice, the desert wanderers, are few in number and add little to the total population of the earth.

The Causes of Aridity.—The range of man's residence upon the earth is limited by various causes. Temperature has much to do with it. In the regions of the far north it is too cold for food-plants to grow and the Eskimos and other tribes must live on a scanty supply of animal food. In the far south, surrounding the South Pole, is a land region as large as a continent on which neither man nor animal dwells, all food being wanting. The winds and rains also play a great part in limiting man's residence. The sun is always shining upon some section of the ocean and causing much water to rise from its surface in the form of vapor, but winds are needed to carry this vapor over the land surface of the earth, and they do this very unevenly.

Thus, in passing over the mountains of the western coastal region of the United States the winds lose much of their vapor in the form of rain. After crossing these mountains they are dry, little rain falls, and the soil becomes parched and unfit for plant-growth. Something similar occurs in various other regions of the earth. The deserts of Asia and Africa are due to the dryness of their winds, and the semi-arid grazing regions of Central Asia have the same cause, the great Himalayan belt of mountains robbing the winds of their moisture.

Realms of Dense Population.—It is only in the fertile regions of the earth, where the soil is rich and deep and rains fall in generous profusion, so that useful plants can be grown in abundance, that great numbers of men dwell and flourishing cities arise. In parts of these fertile regions the numbers of inhabitants are so great as to remind us of ants in their underground nests, for there are cities in which several millions of people live within a few hundred square miles.

Reproduced by permission of the Philadelphia Museums.

FARM ENGINE PUTTING IN A CROP, CALIFORNIA.

Men, of course, are not all kept busy in planting and harvesting. The farmers raise food enough not only for themselves but for the much larger number of dwellers in cities and towns. These city people have work to do very different from that of the farmers. Many of them are employed in shops and factories, making articles which the people want. Others are occupied in commerce, buying and selling those articles and sending them to other places where they are needed. Thus there may be large populations in regions where little food is raised. All that is required is that the people here make things, such as clothing and utensils, which farmers, herders and hunters need, and for which they are ready to exchange food products. Thus, though no more people can live upon the earth than there is food to feed, yet enough of this is raised for the support of a vast multitude of men engaged in duties of all kinds. As a result, the population of the earth is very great, it being estimated at the grand total of 1,500,000,000.

The Continents.—So far we have taken only a general view of the earth's surface. It may be well to look at it a little more closely and see to what extent the several continents are adapted to human habitation. They differ widely in this respect, some of them being largely made up of fertile soil, while others have vast tracts of arid lands and broad forest regions. The latter, while they yield little food, are rich in the timber of which man makes so much use, and are useful in other ways.

North America.—North America is our home continent and appeals first to our attention. Stretching, as it does, from the cold Arctic seas to the warm tropics, it has a wide variety of soil and climate. Canada, a very large country which occupies its northern section, is in great part too cold and infertile to support a large population. Only in its eastern section, the fertile farming country of Ontario, Quebec, Nova Scotia and New Brunswick, are there at present many inhabitants. Mexico and Central America, which occupy the southern section of the continent, are very fertile, but great parts of them are in that tropic and subtropic region in which the heat of the sun goes far to check the activity of man.

The United States.—The United States lies wholly within the north temperate zone, and is a region of admirable conditions of climate, being neither too hot nor too cold for the development of a large, active, and industrious population. In its eastern half the rainfall is abundant and the soil so fertile that no part of the earth is better fitted for the growth of useful plants. The same is the case in the far west, the Pacific coastal region. But in the Rocky Mountain section, and between this and the Sierra Nevada Mountains, is a very large area on which nothing can be grown without the aid of irrigation, and the greater part of which must always be a hopeless desert.

A Gold Mill, Montana.

The Mining Region.—Yet this dry and sterile region is not without its busy seats of population, for gold, silver, copper, coal, and other metals and minerals are found here in abundance, so that numbers of miners may be seen delving into the rocks in search of their valuable contents, while they obtain food by commerce with the neighboring states. Food-getting and mining are only part of the activities of this great and prosperous nation. Its people need a great variety of useful articles and prefer to make them for themselves rather than to buy them from other nations. Thus it has become a great manufacturing country, and makes goods not only for its own use, but to send to other parts of the world.

South America.—We sometimes speak of America as a single continent, and sometimes as the two continents of North America and South America, the narrow isthmus of Panama being their connecting line. They differ in many particulars. Far the greater part of South America is in the torrid zone, the equator crossing it not far north of its widest part. Thus a tropical climate prevails over much of the continent, its people, as a rule, are not very energetic and progressive, and its population increases very slowly. Brazil, its greatest country, is almost as large as the United States, but has only about one-fifth the population and not one-tenth the industry. Brazil has great rivers and much fertile soil, but it is chiefly a great, warm, tropical plain, with very heavy rainfall, so that it is largely covered with a vast, dense forest, too thick for anybody to live in except tribes of savage Indians.

The Western Coast Land.—The lofty range of the Andes Mountains traverses the whole length of the continent on its western side. There is a narrow strip of country between the mountains and the sea but this is largely desert. The winds come from the east and lose their moisture before the mountains are crossed, so that this region is in many parts rainless and plant life is very sparse. In the desert of Atacama, in northern Chile, there is hardly any life, either of plant or animal. But in the mountain sections of Peru and the countries north of it, there is much fertile land with temperate climate, and in the great treeless plains of Venezuela great herds of cattle are fed.

Chile.—The southern section of the continent is in the south temperate zone and has a climate like that of the United States. Here live the most active and progressive of the people of South America. West of the mountains, between the Andes and the ocean, is the very long and very narrow country of Chile, which stretches from the torrid far toward the frigid zone. In the north it is hot and dry, in the south cold and wet, and most of the people live in the central part, where they show such energy that they have been called the Yankees of the South.

Argentina.—East of the Andes is the much larger country of Argentina, nearly as long as Chile, but much wider, and the most productive portion of South America. It is not a land of forests, like Brazil, but one of open plains, like the prairie region of the United States; and though its population is not yet large, it is growing rapidly, many immigrants coming from Europe. On its vast plains millions of cattle and sheep are kept, usually in enclosures of wire fence, so that they cannot wander too far. Other sections of the plains are used for farming, wheat being the principal product. Meat, wool and wheat are the chief staples of commerce, and Argentina has become the most advanced in industrial activity of South American countries.

Eurasia.—If we now seek the northern half of the eastern hemisphere, the region extending from the equator to the north frigid zone, we find ourselves on far the greatest continental area of the earth. This vast outreach of land is usually divided into two continents, Europe and Asia, but the two form really a single continent, which is now often spoken of as Eurasia, the two names being combined. Asia comprises the great bulk of this continental area, Europe being simply a large peninsular mass extending to the west. But they have been so long dealt with as separate continents that it is best to consider them from this point of view.

Europe.—Europe has the distinction of being a continent without a desert. Though the rainfall is much greater in the west than in the east, there is rarely a lack of it anywhere except in parts of Russia. Here the rains at times fail and famines result, but Europe as a whole is a broad realm of fertile soil, yielding vast quantities of food, enough to sustain a large population. But so many people are here engaged in manufacturing that there is not food enough for them all, and much needs to be brought from foreign lands.

FARMING SCENE IN PERSIA.

Asia.—Asia is an enormous continent, more than four times as large as Europe and larger than North and South America combined. Within its wide borders dwell 850,000,000 people, more than half the total population of the earth. But about 700,000,000 of these live in two countries, China and India, the rest of the continent being thinly settled.

The Deserts of Asia.—While China and India are largely fertile, much of Asia is arid, and large parts of it are sandy deserts. Thus the great peninsula of Arabia is an immense desert, with very little fertile land. The same may be said of parts of Persia and of the greater part of Turkestan, or Central Asia, where there are some fertile oases surrounded by broad zones of barren sands. Northwest of China is the extensive desert known as Gobi or Shamo, 1300 miles long, and from 400 to 800 miles wide. Here are some fertile spots and some grassy regions, but most of it is a rainless stretch of sand and gravel.

Mongolia and Siberia.—In the northern half of Asia are two great districts unfit for large populations. One of these is the vast plateau of Mongolia, grass-grown in great part, but with no farming land. Here are kept large herds of cattle, horses, camels and sheep, cared for by a sparse population of wandering barbarians, who know nothing about commerce or the pursuits of the farmer and the artisan. North of this lies the huge country of Siberia, much larger than all Europe and comprising one-third of all Asia. In the southern part of this is much fertile land, but the great northern section is made hopelessly barren by its icy climate, its few inhabitants being chiefly made up of tribes of wandering savages, who live much like the Eskimos of North America and the Laplanders of Northern Europe.

Africa.—South of Europe and Arabia extends the large continent of Africa, next to Asia in size, and nearly twice as large as either of the Americas. Yet it has long been a land of savages, in which commerce was unknown, and few industries existed other than food production. This is not the case at present, for Europeans have taken possession of nearly the whole of it and are fast developing its great wealth.

The Sahara Desert.—Africa has the most extensive desert of the world, the mighty Sahara, stretching from the

Atlantic Ocean to the Nile River, or to the Red Sea, if we add to it the deserts of eastern Egypt. In its broadest part it is about 1000 miles wide, and its length is about 3000 miles. It contains many oases or fertile spots, which help to supply food for the caravans and the wandering inhabitants, but these occupy only a small part of its surface and the total population of this vast region is probably about 2,000,000—less than that of single cities elsewhere. There is a desert region also in South Africa, but the greater part of the continent is highly fertile, and the population in all is about 127,000,000.

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PLUMBAGO SORTING AND PACKING, CEYLON.

Australia.—There remains another section of the world, the great Island of Australia, so large that it is usually classed with the continents. It comes, in fact, close to Europe in size, but is nearly all an arid or desert region, rain seldom falling far inland from the coast. Its fertile portions are those in the vicinity of the coast and here nearly all the white inhabitants settle. The greater part of the island is therefore unadapted to human residence, and presents the odd aspect of a country with a bordering fringe of population around a desert interior. But in these coast settlements there is much enterprise, and Australia is a land of active industry and commerce.

Oceanic Islands.—The story of the continents tells nearly the story of the world, but over the Pacific and Atlantic are studded many islands, as a rule highly fertile, and some of them with large populations. They add their share to the world's inhabitants, but in no great degree to its varied industries, their people being chiefly occupied in plant-raising pursuits. Most populous among them is the productive island of Java, which is nearly as large as England, and has almost as many inhabitants, though they are engaged in very different occupations. Equally important is the large and fertile island of Ceylon, very near the coast of India, and one of the greatest tea-raising countries of the earth. On the preceding page may be seen an illustration of one of the many industries of this island.

CHAPTER III.

CONDITIONS AFFECTING INDUSTRIAL DEVELOPMENT.

Effect of Climate and Agriculture.—In the last chapter the conditions which fit the earth for man's occupation were described. We have next to consider those which help or hinder his activities. There are many such conditions, some of which aid, and others prevent, the development of industry, commerce, and transportation. Climate is one of the most important of these. If it is either too cold or too warm man's activities are sure to decline. If it is too dry, or too wet, the same result appears.

The great plains of far-north America, Asia, and Europe are too cold for food plants to grow, and few people can dwell there. In the equatorial regions of the earth man cannot work long or hard, the heat robbing him of energy. Lack of rain causes great deserts to appear in most of the continents. On the other hand, too much rain, such as is the case in the valley of the Amazon River, has as serious an effect. Grasses and grains cannot grow, the forests become dense, and most of this great space is unfit for man's residence.

Commerce Between the Zones.—It is in the temperate regions of the earth that men work hardest and produce the most, but the inhabitants of these regions have little commerce with those of the frigid and torrid zones. The few people who live in the frigid zones have very little use for the goods made in the temperate zones, and no means of paying for them, either with money or goods. There are many more people in the torrid zone, but part of these are savages, who have no need of clothes or furniture, who live largely on wild fruits, and who do not care to work. We get many things from that region, such as rubber, quinine and other drugs, cocoa, coffee, bananas, fine woods, and other valuable products, but we send little in return, for only the inhabitants of the civilized sections have use for our goods.

Labor in the Temperate Zones.—The great realm of human activity is in the temperate zones, and especially in the north temperate zone, which covers a very large part of the land surface of the earth. Here the weather is neither too hot nor too cold for active labor, and the people are kept busy in farming, manufacturing, inventing, and producing new comforts and conveniences, and selling these to other peoples. Here are the seats of the great civilizations, the countries in which men have the most wants and work the hardest to supply them, and in which education is most advanced. We find something like it in the cool uplands of

House in the Malayan Islands.

the torrid zone, as on the high plateaus of the Andes, but these are narrow and contracted as compared with the great temperate area to the north.

Mountain Ranges.—Mountains are found in all parts of the earth, often rising to great elevations, their upper sections commonly covered with ice and snow, so as to unfit them for human habitation. But they are very useful to man, being covered often to their tops with forests, and thus supplying large quantities of wood. From these, too are obtained iron, coal, gold, silver and other metals, also building stones, and other things of great utility. The rains that fall upon them feed the rivers of the lowland plains, and their swift-flowing streams yield waterfalls which are now being used as sources of water and electric power. This is not all, for these mountain streams are often used for irrigating the plains that border the mountains. This is now being largely done in the arid region of the western United States, the upland waters being carried to the lowland fields, so that on part of these once barren lands great crops are now grown.

The Effect of Mountains on Commerce.—Mountain ranges are often a hindrance to commerce. They are difficult and in some cases impossible to cross. In Southeastern China, for example, are parallel ranges of mountains which cut off the trade of the fertile Yangtze Valley from the seaports of this region, and thus prevent what would be a very valuable commerce. The only suitable crossing places in mountains are what are known as passes, low openings among the high hills which men can traverse. These have long been used as routes of trade, being crossed by caravans of camels and horses, or by human carriers. In our own days the mountain passes in civilized lands are of much use, since railroads traverse them, carrying men and goods far more rapidly than of old. Frequently long tunnels are cut through the rocks to make an easier pathway for loaded trains.

River Courses.—While mountains hinder commerce, rivers help it. By their aid goods can be transported easily and cheaply for hundreds of miles and thus save the slow and toilsome carriage over rough and hilly lands, through forests, or along poor and muddy roadways, such as was widely the case in the past. At present, good roads and level railroads render land transport much easier. But steamboats have succeeded the old canoes and sailing boats on the rivers, so that these are still very serviceable for commerce.

Atlantic Coast Rivers.—It is interesting to find that most of the great commercial rivers of the world flow into the Atlantic Ocean or its connected waters. These include the Mississippi, the St. Lawrence, the Hudson and several others of North America; the Amazon, La Plata, and Orinoco, of South America; the Nile, Congo, and Niger, of Africa, and most of the rivers of Europe. This is of importance, for the Atlantic is the great route of international commerce. Thousands of steam and sailing vessels are always on its waters, carrying hundreds of thousands of people. Few long navigable rivers flow into the Pacific Ocean, either in America or Asia, the most important being the Yangtse of China. The Hoang-Ho of China, the Amur of Siberia, and the Yukon of Alaska are for various reasons of little use commercially. The chief of those which enter the Indian Ocean are the Ganges and Indus of India.

Canal Navigation.—The great advantage of water for commercial purposes has caused long canals to be dug in many parts of the earth, over whose liquid surfaces loaded boats can be drawn. The oldest, longest, and most famous of these is the Grand Canal of China, it being more than 600 miles long and flowing through the heart of the empire. Half as long as this, and far superior as a canal, is the Erie Canal of New York, built before the railroad was known, yet still in use in this railroad age.

There are many other canals in the United States and Europe, in all thousands of miles in length, which follow the course of rivers unsuited to navigation, or connect navigable streams. This is the case in the Baltic region of the North, where goods are largely carried by canal through the wide region between the Vistula River and the western streams and the ports of the North Sea.

Ship Canals.—In recent times a number of important ship canals have been built to shorten the routes of ocean travel.

Locks of Sault Ste. Marie Canal.

Of these, the Kiel, or Kaiser Wilhelm Canal, of Germany, connects the North and Baltic Seas, while the Suez Canal, crossing the divide between the Mediterranean and Red Seas, saves ships a journey of more than 4000 miles around Africa. The Panama Canal, connecting the Atlantic and Pacific Oceans, will, when completed, save a greater distance and be of the utmost value to the commerce of the world.

Lake Traffic.—Of lake traffic, the greatest in the world is that on the Great Lakes between the United States and

Canada. This waterway, measured east and west, is nearly 600 miles long, its only breaks being at the St. Mary's rapids and Niagara Falls, which are passed by canals. Through the Sault Ste. Marie Canal, around the rapids, over 25,000 vessels pass yearly, more than six times as many as go through the Suez Canal, and with half as much more tonnage.

Harbors.—For ocean traffic good harbors are necessary, sheltered places where ships may take refuge from storms and load and unload their cargoes in safety. The Atlantic Coast of America has many of these, among the best being those of Boston and New York. The Pacific Coast has very few, much the finest being the splendid harbors of San Francisco Bay and Puget Sound. Europe is very well supplied with harbors, and this has aided greatly in the development of its commerce; but Africa has few good ones. In the islands of the Pacific excellent harbors may be found. These are held by European powers for coaling and other purposes. Pago-Pago, in the Samoan Islands, said to be the best of them all, belongs to the United States. Manila Bay, in the Philippine Islands, is also a very fine harbor for American traffic.

Plains and Plateaus.—The mountainous regions of the earth comprise a small portion of its total surface. Much more extensive are the broad and comparatively level stretches known as plains and plateaus. The name of lowlands is given to those parts of the surface which are not more than 1000 feet above sea-level. The loftier regions are usually known as highlands.

The lowlands comprise about half the land surface of the earth, and contain ninety per cent. of its population. Where they spread out in a broad level they are called plains, the treeless plains of the United States being known as prairies. Plains are the great food-producing regions of the world. When they have fertile soil and sufficient rainfall they often yield immense crops of grain and other food-plants. The American prairies and the great plains of Russia, Hungary and Argentina produce vast crops of wheat, corn and other grains, and are often called the granaries of the world. There are others, like the broad western plains of the United States, the llanos of Venezuela, and the Argentine pampas, which are covered in great part with luxuriant grasses, on which feed immense herds of cattle, sheep and other animals.

The Plateau Regions.—In the highlands are wide regions of more or less level land which are known as plateaus or table-lands. These are not as regular as the plains, but are often broken and somewhat rugged in surface. Their rainfall is usually small, often only sufficient for the growth of grass, cattle being their most important product. This is the case with the Rocky Mountain, the Mexican, and the South American plateaus, while the Iberian plateau of Spain and Portugal is the home of the merino sheep, a great wool-grower. The plateau of Iran, in Persia and the neighboring countries, is also noted for its fine-wooled sheep. While some plateaus are arid, others are well watered and are rich in plant-life. Africa is very largely an immense plateau, raised far above the sea-level, and is very productive; the great Congo River, with its many branches, crossing a wide fertile highland before it descends in rapids and cataracts to the ocean-level.

River and Coast-Plains and Mountain Valleys.—The flood-plains of rivers, made fertile by ages of overflow of soil-bearing waters, are highly productive and attract dense populations. We have instances in the bottom-lands of the Mississippi and the Yangtse Rivers. Still more thickly peopled are the coast-plains and the lowlands near good harbors. These are usually the seats of busy commercial cities, in which industry thrives.

Something should also be said of mountain valleys, into which rich soil is carried from the hillsides by the rains, while the surface has been made level by the action of water during many centuries. These are often among the most productive parts of the earth and in them the population of mountainous regions thickly gather. Excellent examples are the Wyoming Valley of Pennsylvania and the Shenandoah Valley of Virginia. In addition to these wide valleys are many narrow ones of splendid fertility. Still narrower are the gaps and passes through which commerce crosses the mountains.

Rainfall.—The fitness of the earth's surface as a place of residence for man depends largely upon the amount of its rainfall. Where much more than one hundred inches of rain falls annually nature becomes too prolific for man to contend with. Forests grow in profusion and the culture of food-plants is greatly interfered with. Thus in the rainy regions of India, if the land is left idle for a few seasons, the jungle becomes so dense that it is nearly impossible to convert the soil again into farm land.

Agriculture has its best opportunities where the rainfall ranges from about forty to fifty inches annually and is well distributed over the season of plant-growth. Where there is less than fifteen or twenty inches annually the farmer cannot hope for good harvests unless he is able to water his land by irrigation,—that is, by spreading the waters of streams over the fields through the aid of canals and ditches. But in the semi-arid regions grass often grows abundantly and these are the great grazing sections.

Irrigation.—Where nature has not done its duty in regard to rainfall man can often replace it, and fit the land for profuse fertility. He brings the waters of mountain streams or of down-flowing rivers to the farms by means of long canals, from which ditches and little channels convey it to the fields, and make them so highly productive that two or three crops may at times be grown in a single season. Water being always present, the crops never fail.

Only small areas can be thus treated, but they are spread over many parts of the earth, such as China, India, Persia, parts of Asia Minor and Europe and sections of America and other countries. Egypt is naturally irrigated by the overflow of the Nile, which runs through a desert, but makes its banks on both sides enormously fertile. In the western part of the United States, where there is an immense arid region, large areas have been reclaimed by irrigation. The government has taken this work in hand, and is building great dams to hold back the waters of the mountain streams and feed them out to the farm lands during the growing season. The work now being done will cost the great sum of $70,000,000, but it will give this country about two million acres of new and very rich farming land, worth to the nation far more than its cost. Thus a region which has long been destitute of population may have millions of inhabitants in the years to come.

OPENING AN IRRIGATION DAM, TRUCKEE RIVER, NEVADA.

CHAPTER IV.

THE HISTORICAL PROGRESS OF INDUSTRY AND COMMERCE.

Primitive Arts.—Very many centuries ago, when man was young upon the earth, the arts pursued by him were the simplest we can imagine. Yet they were the foundation of those of the present day. We can see in fancy a primitive savage breaking a piece of flint so as to get a fragment with a sharp edge, to serve him as knife or hatchet. A second view may show him trading this with another savage for a bunch of bananas. If we look again we see him fling the bananas over his shoulder and carry them off to his hut, miles away. In this simple outlook we perceive the beginnings of production, trade, and transportation. We have those arts still, but they are now far more developed and diversified.

Early Pioneer Trade.—In the early days of our own country men lived and acted on the same general principles though not in such primitive ways. One of the first settlers, for instance, may have manufactured at home some handy tool, taken this into the woods and traded it with an Indian for a wild turkey which he had just shot, and carried the bird home on his shoulder. No money passed. Money meant nothing to the Indians of that day, and the whites made no use of it in their dealings with the natives. The transactions between them were as primitive as those of the men of the stone age.

Modern Methods.—How is it in our own time? In some great rattling and roaring workshop an article is made of iron or wood, cotton or wool, sent in a great steamship to London or Liverpool, and exchanged perhaps for a hand-some shawl that came from Calcutta and was woven by skilful hands in the far-off Valley of Cashmere. This exchange is not direct, as in the former cases, but indirect, money being the go-between. But the gold and silver used are only useful aids, the transaction consisting in principle in the exchange of one article for another.

A Dinner-Table Study.—This system of exchange is often very complicated. We may sit down to a meal made up of food that came from all parts of the world,—tea from China, coffee from Brazil or Java, sugar from Cuba or Germany, flour from Minnesota, meat from Texas, fruit from Florida or California, spices from Asia or Africa. The table may be of oak from Maine, the chairs of maple from Michigan, the dishes from the Trenton potteries or the porcelain kilns of France, the knives of Sheffield steel, the spoons of Montana silver, and so on in a circle that may take in the whole world.

We paid money for this food and furniture, but that money came to us in payment for services rendered by us or our parents in the manufacture or handling of goods, or for some labor or service connected with industry. Labor, like money, is an agent in exchange. In every case we get something which we want and others get something which they want. The money which we use we received for labor of some kind. The method is not a direct one as of old, but often a very roundabout one, in which thousands of persons may take part and money pass through many hands. But the one principle of exchange runs through it all.

Industry in History.—The history of the world is of two kinds. One kind has to do with industry and commerce; the other with political, intellectual and moral movements. Here we are concerned with the first kind. In reading history we learn much of what man has been doing with his hands, aided by the mind behind them. If we had lived in the far-off times of ancient Egypt we might have seen the people of the Nile Valley building great temples and pyramids and excavating deep rock tombs. On the walls of these are carved pictures of workmen busy at many kinds of work. On the banks of the Euphrates, in ancient Babylonia, work of the same kind took place. Bricks were made of the river clay and temples and palaces erected, while books were produced by stamping words on clay, instead of writing or printing them on paper.

We are told of many other forms of industry in these ancient times, and as we come down through the ages we find the methods widening and improving. The people of ancient Greece were not all engaged in thinking and writing and those of ancient Rome did not spend all their time in fighting. Things of many kinds were needed and had to be made; and as hard work was done then as is done among ourselves—though then the most of it was done by slaves, and the tools used were crude compared with those we possess.

Later Industries.—If we come down to mediæval times, history has much to say about fighting and frolicking, but little about working. The workmen of those days were no better off than the slaves of earlier times, and historians did not trouble themselves to write about them. But in looking over Europe we see many evidences of active labor in those days. In fact, the world of civilization has always, in a measure, been like the world we see around us, a bustling, busy world, in which the bulk of the people were busy in doing something. To-day some are raising food for us to eat, others making clothing for us to wear, others building houses for us to live in, and others catering for our needs in many ways. There is nothing new in this; yet though we may be no busier than the men of old, by the aid of machinery we are able to produce tenfold more, so that the comforts and luxuries we desire can be had in much greater profusion, and in this way the poor people of to-day have many things which the kings and princes of old could not enjoy.

Methods of Transportation.—Such is a brief glance at the history of industry. Now what shall be said about the history of commerce? We perceive traces of this also far back in ancient times. Transportation of goods began, of course, in very simple methods. In the early ages men had to carry everything that needed to be moved in their hands, or on their shoulders. But in time the backs of horses, camels, and other animals came to be used for this purpose. They are still so used in the caravans of Asia and Africa. The wheel also was invented and wagons and carts of various kinds came into use. It is interesting to learn that these early methods of land transportation were all that men knew until nearly our own time. The railroad, which finally came to replace them, is not a hundred

A Zebu Cart.

years old, and the ancient methods of transportation are still in common use. Even the use of men's backs as carriers is to be seen in many parts of the world.

Water Traffic.—Traffic by water was early found to be easy and convenient. Men at first used logs in crossing or descending streams. Then the skins of animals blown full of air or canoes cut out of logs were used. After the canoe came larger and better boats, moved at first by paddles or oars and finally by sails. While long used to carry men only, these in time were employed to carry goods. They grew in size until they left the rivers for the seas and became ships capable of sailing over stormy waters, and large enough to carry great loads of goods. Thus from the floating log man advanced to the sailing ship.

Early Ocean-Commerce.—It is with the development of the ship that commerce first comes into history. While land-traffic was making little progress, water-traffic was showing important steps of improvement. The first active commercial nation of which we are told in history is the Phœnician. Settling on the seacoast of Syria about 4000 years ago, the Phœnicians engaged actively in ocean-commerce, developing the first great seaport cities, those of Tyre and Sidon. For centuries they served as the carriers of the nations. Egypt and Assyria were then the great political powers and the goods of these were carried in Phœnician ships, which made daring voyages far west over the Mediterranean and into the waters of the Atlantic. It is even said that one of these bold captains, at an early date, sailed around Africa; a feat which was not again performed until the Portuguese voyages, two thousand years later.

Carthage and Its Rivals.—The second great commercial city of which history tells us was Carthage. Founded on the northern coast of Africa by colonists from Tyre nearly three thousand years ago, it grew to be the greatest commercial centre of ancient times, until it was finally destroyed by Rome, its rival. The Greeks early grew active in commerce, but were never so daring as the sailors of Tyre and Carthage. The Romans used their ships more in war than in commerce, and after the fall of the Roman empire ocean-traffic long declined.

Mediæval Commerce.—If we come down to about a thousand years ago, we find that commerce had again grown active, especially in the Mediterranean. There was much trade with the Far East by ship and caravan, Venice and Genoa becoming in time the great commercial cities. From India came rich cloths, precious stones, ivory, spices, and other valuable goods, which Europe paid for partly with gold and silver and partly with its less esteemed fabrics. When the Arabs captured Egypt and the Turks took Constantinople this commerce with the East for a time came to an end, though the Arabs in time developed an active commerce.

Recent Commercial Progress.—Cut off from their old trading routes by the Turks, the nations found new ones; the Portuguese sailing around Africa to India, and Columbus crossing the Atlantic to America. The old Mediterranean route of commerce now turned westward to the ocean, and since those days the area of trade has widened until it embraces all the waters and lands of the earth. In this progress Holland succeeded Portugal and Spain in commercial activity, and England rivalled and soon surpassed Holland. Only in very recent times has the supremacy of England been threatened, Germany and the United States becoming its greatest rivals. Meanwhile great commercial cities grew up in many parts of the world, while great manufacturing cities also arose, as a result of the vast development of the industries.

Hindrances to Commerce.—Commerce in the past had much to contend with. Had it not been for robbers on land and on sea its progress would have been much more rapid. For ages the merchant never felt safe. The frequent wars, small and large, put an end for years to security in trade, while commercial cities were often pillaged or destroyed by battling armies. In times of peace there was little more safety. The merchants were robbed by the owners of castles or lords of towns, or their profits were taken in the form of high taxes or forced loans—never to be repaid. Brigands and outlaws of all sorts aided in making the overland trade routes insecure. Pirates on the ocean took the place of plunderers on shore, and so low was the moral sentiment that piracy was considered by many an honest mode of livelihood. This was the case in England as late as the reign of Queen Elizabeth. Almost in our own times whole nations took part in piratical ventures. These were the Barbary nations of Northern Africa, whose piracies continued for centuries, until finally suppressed by the warships of the United States.

The Ships of Columbus.

Fortunately this is now at an end. Piracy has been almost wholly suppressed on the ocean and brigandage on land. Even in times of war commerce, once preyed on freely by warring nations, is now safe. These are important causes of the wonderful activity of modern commerce.

For the first time in history the merchant is secure from robbery. His only sources of peril now are those of storm and the other destructive agencies of nature. And if he insures his cargoes against loss from these he has little or nothing to fear.

We see widely around us the results of this modern security of commerce. Instead of the occasional caravans of old, their people armed and in constant dread of attacks by strong bands of prowling robbers, the products of fields and factories are now carried in vast quantities in swift railroad trains, exposed to no perils except those coming from natural causes. On the ocean the same is the case. The small sailing ships of the past, liable to be seized by piratical craft, are replaced by huge steam-vessels, capable of carrying immense cargoes, which no sea-robber would venture to molest. This safety has had its share in converting the small and desultory commerce of the past into the enormous and unceasing commerce of these later times.

CHAPTER V.

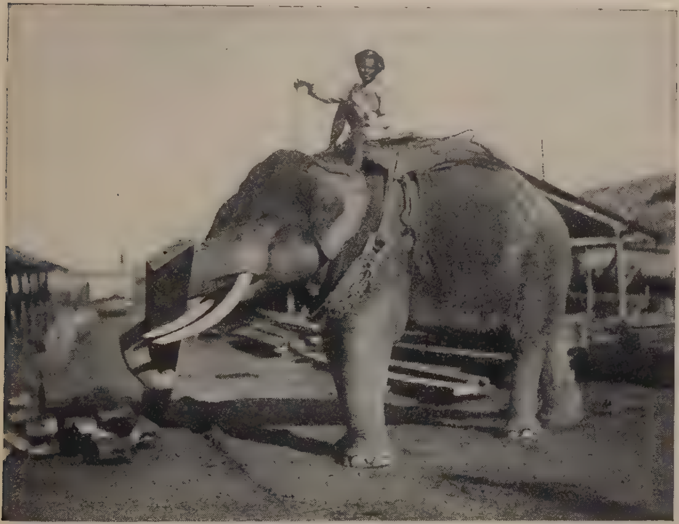
METHODS AND AGENCIES OF TRANSPORTATION.

From Producer to Consumer.—At the foundation of commerce lies transportation. Goods are rarely transferred directly from the producer to the consumer. They are usually conveyed by hand or by some other method of carriage, over roads, bridges, railways, or water surface to the place where they are needed. This has been done ever since man came upon the earth, and in many ways, most of which are still in use and may be seen in various regions. These methods of transportation are interesting and important.

Men as Carriers.—Man was the earliest "beast of burden," and may still be seen, in many parts of the world, carrying heavy loads on his back or on other parts of his body. Thus the negro women of Jamaica carry loads of bananas or other fruits, often of more than a hundred pound weight, on their heads to market, and a traveller in Mexico tells us of Cargadores, or carriers, who travel at the rate of thirty miles a day carrying heavy loads. He says: "One had a sofa upon his shoulders, strapped on I could not see how; another bore a tower of chairs locked into one another and rising not less than eight feet above his head; another carried a hen-coop, with a dozen or twenty hens, and others were conveying laden barrels and various household goods."

This mode of transportation may be seen in many other countries. In China men do most of the carrying over the mountain passes. They are cheaper than camels or donkeys and are used instead. In Central Africa the negro carriers bear heavy weights for long distances day after day. The Indian porters of Guatemala begin to carry burdens when they are only six years old, and grow so skilful that they can carry five hundred miles. Much walking hardens the skin of their feet so that they can walk barefoot over the mountains without pain.

Pack Animals.—Very long ago animals were brought into use for this service, the dog, the horse, the donkey, the camel, the llama, the ox, and these are still employed in their native lands, and some of them in all countries. Even the lordly elephant is made use of in India to move great weights by the aid of its tusks and trunk. Go where we will we can see pack animals at work, and in crossing the passes of high mountains the donkey and the mule are invaluable. In desert regions the camel is the common freight-carrier.



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ELEPHANT PILING LUMBER, INDIA.

Draft Animals.—When the wheel was invented and carts and wagons were brought into use, animals were employed to draw loads in these vehicles, instead of carrying them on their backs. And this is one of the chief means of local commerce to-day. In all our cities the horse and the mule may be seen, dragging heavy loads in carts, wagons or drays. In Lapland the reindeer is the draft animal and in Greenland the dog. It is by aid of the dog that the Eskimos drag their sledges. Elsewhere the ox is used for this purpose, drawing the plough or the cart, and in Eastern Asia and some other countries the buffalo is the common draft animal. The carabao, used for all draft purposes in the Philippine Islands, is a variety of the buffalo.

Man has to take part in drawing loads—and even woman, for in parts of Europe women and cows may be seen harnessed together to the plough. The wheelbarrow, a familiar object in our streets, in China largely takes the place of the horse and may be seen everywhere bearing goods or passengers. The Chinese wheelbarrows are larger and heavier than ours, and are pushed or pulled by men, and loaded with goods. Some of them are supplied with sails, so as to get the benefit of the wind. The jinrikisha, a light two-wheeled passenger carriage drawn by men, is in common use in Japan and the coast cities of China, and has spread to some other lands.

Early Roadways.—For traffic of almost any sort some kind of road is needed. Men, indeed, can carry loads over narrow paths and make their way with ease through forests, and pack animals often follow mere foot-tracks. But for any kind of vehicle a roadway of some sort is requisite. When white men came to America they found Indian trails passing through the forests and over the mountain passes, some of them hundreds of years old, and the first wagon roads followed these trails. Some of the early city streets were also laid in the lines of winding trails, and even railroads followed these tracks. The Indians had made their paths as easy and level as they could, and thus their old forest routes were the best to be found for early roads and railroads.

We may go back of the Indian to the bison or buffalo for the beginning of many of the later roads. This was especially the case in the roads through the mountains, which before the Civil War mostly followed what were called "buffalo roads." These animals made their way across the mountains by the lowest and easiest paths, and several of the early railroads, as the Pennsylvania, the Baltimore and Ohio, and the Chesapeake and Ohio, follow the easy grades once used by the buffalo.

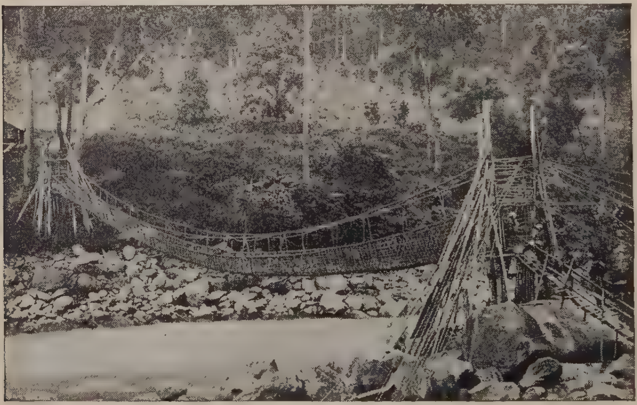
Road-Making.—The art of making roads has been one of slow growth. Our forefathers did their travelling largely over roads that were beds of mud in winter and of dust in summer. It was not uncommon for the vehicle to sink to the hub and need to be pried out of the mud. Not until about the middle of the eighteenth century did wheeled carriages come into use in our country. The famous Conestoga wagons of Pennsylvania for freight-traffic were in use earlier, being drawn over the miry roads by six or eight horses. At a much later date similar wagons were employed in crossing the western plains.

A Conestoga Wagon.

Stage travel began late in the eighteenth century, the roads being so bad that three miles an hour was the average rate of travel. It took two days to go from Providence to Boston, and a week to go from New York to Boston. The first two-day coaches between New York and Philadelphia were advertised as "flying machines."

During the nineteenth century many good roads were built in the older states, but road-making progressed very slowly in the States west of the Alleghanies and south of the Ohio River, and in many parts of this region the roads are still in a wretched condition.

Bridges.—In these early days streams were crossed at shallow places, or fords. The first bridges built were rude wooden structures, such as one may now see over narrow country streams. For ordinary foot-travel a log would often serve as a bridge. An early type of bridge, still in use in many parts of the world, is the primitive suspension form, made of tough flexible plants or ropes, twisted into cables and swung across chasms or deep streams. Two such cables, connected with some kind of footway, is still a common form of bridge in the mountain regions of India and South America.



A RATTAN SUSPENSION BRIDGE.

As time went on bridge building developed, stone arched bridges in many places replacing the wooden structures. At a later date iron began to take the place of wood and stone, and it is now the chief material used in the bridges of civilized nations. The old cable-suspension bridge has been replaced by the wire-suspension, the old stone-arch by the steel-arch, while great cantilever and truss bridges may be seen in many parts of the world.

Tunnels.—Within the past century the art of tunnelling has made wonderful progress, and many streams are now passed by tunnels beneath them instead of bridges over them. The most striking examples of these are the tunnels under the Hudson and East Rivers of New York, especially the great Pennsylvania Railroad tunnels. Railways are also carried through difficult mountain regions by the aid of great tunnels excavated through miles of rock. The most interesting of these are the great tunnels through the Alps, the $6\frac{3}{4}$-mile Alberg, the 8-mile Mont Cenis, the $9\frac{1}{3}$-mile St. Gothard, and the $12\frac{1}{2}$-mile Simplon tunnels.

Railways and Waterways.—Within the past century the railway has arisen and developed enormously and many artificial waterways, known as canals, have come into common use. Of these we shall speak at length in a later chapter. By means of them transportation has been enormously cheapened. Carriage of produce by water has always been cheaper and easier than by land-conveyance and the boat developed into the sailing vessel at an early date, ships having been in use for ocean-traffic for several thousand years. These grew in size as time went on, but with little change in type, and great numbers of sailing vessels are still in use. When the steam-engine was invented it was applied to the vessel before it was to the locomotive and steam-transportation on water began earlier than on land. Of late years electricity has come into use both for passenger and freight traffic, and in the time to come the electric car may take the place of the steam locomotive.

Aids to Commerce.—One great aid to commerce is the post-office. The carriage of letters has very greatly increased and is of immense utility to business. Of still more advantage is the electric telegraph, which keeps merchants in daily touch with the range of prices in all the great centres of trade. Thus a cotton dealer in our country learns every day what cotton is selling for in Liverpool, and knows when it is best for him to buy or sell. And the farmer can judge daily if there is a profitable market for his wheat or corn. Many hundreds of thousands of miles of telegraph wire cross the continents and run under the oceans, and most things of importance that take place in the world are made public every day.

The telephone is another great aid to business, merchants being able to talk with one another when a thousand miles apart almost as easily as if they were together in their offices. Most wonderful of all these methods of rapid sending of news is the discovery of wireless telegraphy and telephony. These, of course, are young as yet, but they are already of much service, and no one can tell how great may be their utility in the years to come.

CHAPTER VI.

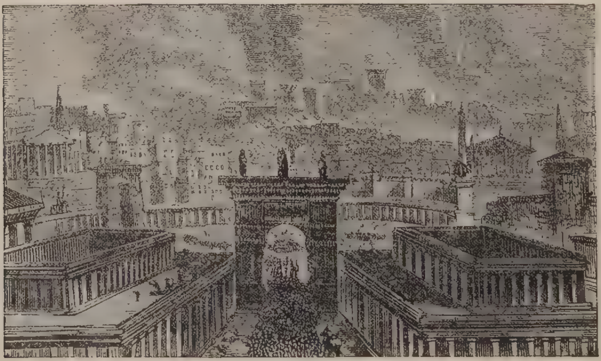
ORIGIN OF CENTRES OF INDUSTRY AND COMMERCE.

Industry and Commerce.—The demands of commerce are urgent and persistent, and in response to them some of the greatest cities upon the earth have arisen, cities of incessant bustle and activity, into and out of which goods of every kind come and go. These cities are the earth's central points of collection and distribution—the great halfway houses between the producer and the consumer.

The demands of industry have been as urgent and in their turn have given rise to important cities of a different type from the bustling marts of commerce. The inhabitants of these cities are devoted to the manufacture of articles to be sold elsewhere. The locations of cities of these two kinds may be seen on the maps of every country, in many of them commerce and industry being combined. If to these we add the political centres, or seats of government, we have before us all the large cities of the world.

The Origin of Cities.—If it be asked how these cities arose, what influences aided in placing them just where they are, an easy answer might be given in some cases, but in others it would prove very difficult. Many of them came into existence long ago, under conditions of which we find no statement in history. If we go back to ancient times, indeed, we find that many of the leading cities arose under military and political influences. These were the great forces in the far past, commerce and industry being then of secondary importance.

The remote past yields us two great commercial cities, Tyre and Carthage, built by the leading trading people of the past, and in localities which long gave them a controlling influence over the Mediterranean trade. Alexander the Great destroyed Tyre and built Alexandria, which became a great commercial metropolis. Athens, which began as a military stronghold, also grew into an active commercial city. The destruction of Carthage by Rome opened the field to other cities, one of them Syracuse, on the island of Sicily. But this was not an age suited to give rise to many large centres of commerce, as they were apt to fall a prey to conquering armies when they grew rich.



THE BURNING OF CARTHAGE.

Political Strongholds.—The industries of the past were largely centred in the great political strongholds, the capitals of kingdoms or empires. Egypt had several such cities during its long career, and the same was the case with Mesopotamia, where in time two great political cities arose, Babylon and Nineveh. In Persia grew up Persepolis, the capital of the Persian conquerors. We know nothing of the origin of these cities, or of the many others of minor importance. An industrial or commercial advantage, or a special adaptation to defence against enemies may have ruled over their origin. In some cases, perhaps, this was due to the whim of a powerful ruler. Where the king fixed his court people were sure to gather and industries to develop, and every capital of a nation of importance in the far past became an active centre of population. The same, indeed, may be said of the capitals of modern nations.

Rome, the capital of the greatest empire of ancient times, began at a place selected as a strong point for defence among the hills of the Tiber. Like Athens, Jerusalem, and various other cities, it began as a hill fort or stronghold. Its successful resistance to attacks in its early days showed that its location was well chosen. Its later greatness was due to its fortune in becoming the capital of a conquering nation.

Eastern Centres of Population.—Similar influences ruled in Asia. Peking, in China, is the final one of several successive capitals, it being chosen by the Mongol conquerors in 1280. In the west, Teheran, Bagdad, and Cairo arose as political capitals of the Moslem invaders. Jerusalem and Mecca owed their prominence to their position and record as religious centres. In India, Calcutta began its career as a military and political post of the English invaders about 1700. Bombay, its commercial rival, owed much of its rapid development to its becoming the market place of a great cotton-raising district and its advantageous situation for the British trade. In China, Shanghai and Canton owe their importance to harbor advantages, and Hong Kong to the fact of its being the political and commercial stronghold of Great Britain on the Chinese Coast. If we go farther south we find that two large cities, Sydney and Melbourne, have arisen as the commercial centres of Australia. These rank with Buenos Ayres as the leading cities of the south temperate zone.

American Towns.—This rapid glance at the record of some of the great cities of the past, and those of modern date outside of Europe and America, may prove of interest as introductory to a review of the origin of our home cities. The industrial and commercial centres of the United States grew up under conditions familiar to us, starting often under more or less accidental influences and developing into large cities when their location proved advantageous.

The Country Town.—In regions of active agriculture a "country town" is sure to grow up as a market centre of the surrounding district. Here the farmers sell their products, or ship them by rail or boat, and buy supplies for house and field. The all-embracing "country store" keeps goods of every kind, and the shoemaker, blacksmith and other small artisans find customers for their wares. Thus the population grows, people finding work to do, while retired farmers are apt to make the town their place of residence.

Some favoring influence usually gives the start to such a town. A "cross-roads"—where two highways meet and cross—may make a place easy of access to the farming people. A ford, at which teams can easily cross a stream, or a landing place to which small vessels can make their way, prove places for people to settle. A country inn at a good resting place on a high road may attract a blacksmith and store-keeper, with the result that a village slowly arises, and perhaps grows into a town. Many such towns have developed around sidings built for the convenience of railroad men. If these proved handy places for shipping produce or receiving goods, families of working people would be apt to settle around them and towns in some cases grow up, these in time often developing into cities. People are likely to settle at places where they can find work of any kind to do, and the mere fact of their settling often makes more work and brings more people. Thus villages may grow into towns and these into cities.

Military Stations.—Some of the forts built by the early settlers have developed into large cities. Those built by

Daniel Boone and other pioneers to protect them against the Indians became the seats of such cities as Nashville, Lexington and others in Kentucky and Tennessee. Cincinnati and Louisville, on the Ohio, began as convenient camping places for pioneer settlers. To the early French adventurers, we owe the locations of such centres as Quebec, Montreal, Detroit, St. Louis, Natchez, and various others. Forts were built at these places and towns grew around the forts. Albany and Pittsburg began as military posts, and at a much later date where stands the now colossal Chicago was a small military station on Lake Michigan.

Penn's Landing at Essex House, Chester.

Water-Power Localities.—In many places a mountain stream, broken by rapids or water-falls, has led to the growth of a city. Such a stream would yield good water-power, by which mills and factories could be run cheaply. There are many such localities in New England, and around these flourishing manufacturing towns often grew up. Though the steam-engine in time replaced the water-wheel, these places held the advantage of their early settlement, in some cases where another place might have served better. As an instance we may name the two cities of Oswego and Syracuse, New York. Oswego has the advantage of being a lake harbor and having fine water-power, but Syracuse had the start and has left its sister city far in the rear. The most striking example in the West of a city having its start in a water-power is the great flour-making Minneapolis, which obtains its working force from the Falls of St. Anthony, on the Mississippi, and its materials from the vast wheat fields of the West. St. Paul, its twin city, began in 1840 in some log huts built by men engaged in buying furs from the Indians and selling whiskey to the soldiers at Fort Snelling. It is now the capital and chief distributing point of Minnesota.

Coal and Iron Centres.—Pittsburg, as above said, began as a fort at the head-waters of the Ohio. The abundant coal and iron in its vicinity gave it the leading place in the iron and steel manufacture, which it has since maintained. To iron and steel we owe other important centres of industry, such as Scranton, Reading, Altoona and Pottsville, in Pennsylvania; Birmingham, in Alabama, and Chattanooga, in Tennessee. The vicinity of great iron deposits near Lake Superior gave rise to the city of Duluth and the mines of Colorado to Denver.

The Effect of Chance.—Chance has played its part in the history of cities. It was largely chance that gave Chicago its supremacy, Milwaukee and some other places being as well situated for the lake trade. The same may be said of a dozen cities in the West. They simply had the advantage of early settlement, or the benefit of some special aid. Thus an iron bridge built over the Missouri at Kansas City gave this place the supremacy in trade over the near-by city of Leavenworth, which once was in the lead.

Seaport Cities.—Our chief seaports were all places of early settlement, chosen by the pioneers for their harbor advantages. The superior harbor of Boston quickly gave it supremacy over Plymouth, the first settlement. New York was admirably seated as a seaport, though the great trade developed by the Erie Canal first enabled it to leave Boston in the rear. Philadelphia had the disadvantage of being a hundred miles from the sea, but had special advantages for manufacturing development. Baltimore had also to contend with the disadvantage of being many miles from the seaboard, but railroads have brought it trade. Charleston and Savannah were much better situated for ocean trade than the last named cities, but were not centres of an active demand like the northern ports, which drew from the great and productive Mississippi Valley and the active centres of manufacture in the North. Jamestown, the first English settlement, was destroyed as the result of a colonial rebellion, and was succeeded by the better situated Norfolk and Richmond.

New Amsterdam.

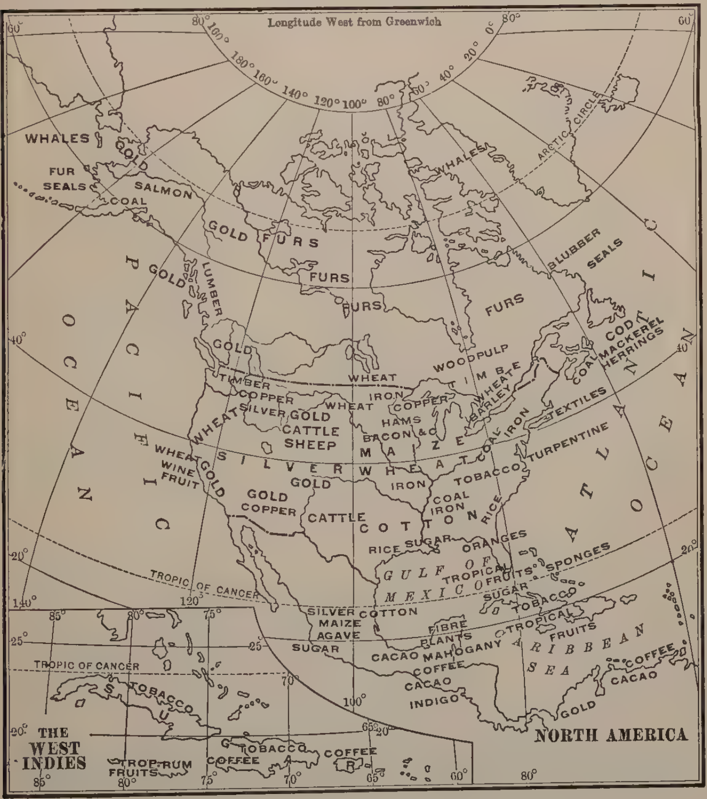
Gulf and Pacific Ports.—Mobile and New Orleans survived out of the several French ports along the Gulf region as the most advantageously situated for trade, Mobile from its fine harbor and New Orleans as the lowest available point to handle the large trade of the upper Mississippi. Galveston has the advantage of an excellent harbor and of having the great agricultural State of Texas to draw upon.

Of the ports on the Pacific Coast, the growth of San Francisco and of Seattle was inevitable, they being seated on the only harbors of any importance on the coast of our Pacific States. We have been dealing here with a broad subject and have been obliged to handle it very briefly, but hope that what has been said will prove interesting and instructive. The great modern cities of the remainder of the world will be spoken of in connection with their several countries.

CHAPTER VII.

CLIMATIC AND PHYSICAL CONDITIONS OF THE UNITED STATES.

Importance of the United States.—In setting out on a more detailed review of the resources and commerce of the world, it seems advisable to begin with our own country, the United States of America. This is not alone



Map Showing Products of North America.

because it is of especial interest to all Americans, but still more from its high industrial importance among the nations of the earth. Surpassed in size by the British, the Russian, and the Chinese empires, it excels them all in geographical and industrial advantages of position. Its location is especially fortunate, being almost wholly in the warmer half of the north temperate zone. Also, from its wide area of fertile soil and its vast mineral resources, it is admirably fitted by nature to become the seat of one of the greatest nations of the earth.

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Steam Harvester at Work.

Extent and Productiveness.—Occupying the central portion of the North American continent, the United States is bathed on its two sides by the Atlantic and Pacific Oceans, its greatest length from east to west being about 2800, and its greatest width from north to south about 1600 miles. This gives it an area of a little over 3,000,000 square miles. Including Alaska and its island possessions the total area under its control is about 3,750,000 square miles, being closely equal to that of all Europe. In this area is included an immense expanse of fertile land, the great Central Plain, or Valley of the Mississippi and its tributaries, which occupies about one-half the total area and is highly productive throughout nearly all its extent. If to this we add the well-watered and fertile regions of the Atlantic and Pacific coast-lands, and the broad grazing plateau of the interior, we obtain a vast spread of territory unsurpassed in productiveness.

Natural Divisions.—Two mountain systems divide the United States into three agricultural regions. These are the Appalachian uplands of the East and the extensive Rocky Mountain system of the West. Between these lies the above mentioned Central Plain. East of the Appalachians is the Atlantic slope and Coastal Plain, and west of the Rocky and Sierra Nevada Mountains is the Pacific slope. These are the great geographical divisions, divided politically into States and Territories, and physically into various areas of special climatic, agricultural and surface conditions.

Climatic Conditions.—The latitude of the United States, with a range of nearly twenty-five degrees (from 24° 30′ to 49° N. lat.), is such as to give it a wide diversity of climate, semi-tropical in the far south, and approaching the frigid in the winter of the northwest. The winds have much to do with these variations of climate. Thus the Pacific Ocean yields warmer winds than the Atlantic, with the result that regions on the Pacific slope are warmer than those of the same latitude on the Atlantic slope. The interior is affected by warm winds from the Gulf and cold winds from the plateau regions of western Canada, the birthplace of the "cold wave." As a consequence, there is great variations of temperature in the interior, the thermometer often reading a very low degree in the winter of the Dakotas and neighboring states. This effect is apt to extend to the East and South, but with much less severity

Rainfall.—The eastern half of the country, affected by the moist winds from the Atlantic and the Gulf, has an abundant rainfall, everywhere of more than twenty inches annually, and fairly well distributed throughout the year. The rains on the Atlantic slope and the Appalachian Mountains average from fifty to sixty inches, and more than sixty in a few small areas. West of these mountains the rainfall grows less, but is of sufficient quantity for profitable agriculture. If we pass, in our westward journey, the 100th degree of longitude, we find the rainfall so small as to bring to an end the pursuits of the farmer, but there is sufficient for a good growth of grass, suitable for the grazing of cattle, over a broad stretch of territory. In the Pacific region similar conditions prevail, but through a far narrower width. The warm ocean winds bring in abundant moisture and a section of the coastal region of the Pacific States receives more than sixty inches annually. This diminishes southwardly so that the southern portion of California is a region of aridity. The western slopes of the mountains of the coast and of the Sierra Nevada range, with the intervening valleys, are well watered, but after passing the latter range the winds become so dry that a great arid region prevails between the Sierra Nevada and the Rocky Mountains. Here lies the Great Basin, a broad desert region larger than the whole of France, the greater part of it condemned to hopeless aridity.

Self-Sustaining Capacity of the United States.—As may be seen from its variety of soil and climate, and its widely distributed rainfall, the United States is one of those fortunate countries which are capable of producing nearly all the food they need within their own borders. It is the same with the raw materials of manufacture, there being few other countries in the world so well fitted to support its population without dependence on the products of other regions. Few of the countries of Europe are so fortunate.

Thus separated by wide oceans from the other continents, and abundantly able to take care of itself, the United States is exceptionally well situated.

The Atlantic Coastal Plain.—The Atlantic coastal plain, extending from the Appalachian Mountains to the sea, and from New England to Florida, is of varying width, being narrow in the north and expanding in the south to an average width of about two hundred miles. New England is a plateau region, the surface abruptly sloping, and furnishing abundant water-power. This fact led at an early date to a rapid development of manufactories in that region, though steam is now largely replacing water as a source of power. As the poor soil rendered farming unprofitable, manufacturing was undertaken, cotton goods being largely produced. Shoes and other leather goods are also extensively made. The coast waters and those of the farther north are rich in cod, mackerel and other fishes and give employment to many of the people, and there is a large commerce, especially from the port of Boston.

A Cotton Spinning Mill.

In the southern section of the coastal plain the soil is much more fertile, and farming is an active occupation.

There are here also good water-powers on the line where the rivers descend from the higher levels to the flat lowlands, and various manufacturing cities have grown up, including Richmond, Raleigh, Augusta and Columbus. The Atlantic coast-line is very irregular and there are many good harbors, including those of Boston, New York, Philadelphia, Baltimore, Norfolk, Charleston, and Savannah.

The Appalachian Highlands.—The long and narrow mountain system known as the Appalachian begins in the Laurentian Hills of Canada and extends southward as far as Georgia and Alabama, sinking away into lowlands as the Gulf of Mexico is approached. In it is included the White and Green Mountains of New England, the Adirondacks and Catskills of New York, and various parallel ranges farther south, especially the Blue Ridge and Alleghany chains of the middle and southern sections. Between these ranges are broad, fertile interspaces, like the Shenandoah and Cumberland Valleys. The mountains nowhere rise to great height, the highest peak being Mt. Mitchell, in North Carolina (6710 feet). From them flow the rivers of the coastal plain, the Connecticut, Hudson, Delaware, Susquehanna, Potomac, James, and other streams.

These mountains have a double value to the country. They were once everywhere covered with forests. These have been largely cut down in the north, but in the south they remain, and here lumbering is an active pursuit. The production of tar and turpentine is also of importance in the pine woods of North Carolina and Georgia. Their other source of value is in their mineral wealth, coal and iron being especially plentiful, including the unrivalled anthracite coal beds of Pennsylvania. Petroleum is also important and there are various other valuable products.

The Mississippi Valley.—The Central Plain of the United States embraces the Valley of the Mississippi and its many tributaries, extending from the Great Lakes to the Gulf of Mexico, and from the Appalachian Mountains to the foot hills of the Rocky Mountains. Here is a vast and highly fertile area for the use of the farmer, one which is regarded as the leading agricultural region of the world. That portion of it north of the Ohio and bordering the Missouri is in great part a prairie country, destitute of forest, free from stones, and with an exceptionally deep and rich soil, splendidly adapted to the growth of corn, wheat and other cereals. The prairies range through Ohio, Indiana, Illinois, and several of the States west of the Mississippi. From their western border extend the

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A. Cup System of Collecting Turpentine
B. Dipping Crude Turpentine

high plains west of the 100th meridian, a partly arid stretch of country two hundred miles wide and fourteen hundred miles long, and forming the great grazing section of the United States. Millions of food-animals are fed on these grassy plains, large numbers of them being shipped annually to the great stock yards of Omaha, Kansas City, St. Louis and Chicago.

The Great Lakes.—North of the prairie region lies the country bordering the Great Lakes, extending into Canada. Here the land is more rolling than on the prairies and much of it, especially in Michigan and Wisconsin, was formerly covered with dense forests. Great part of this woodland has been cut off, yielding farming land which is devoted to fruits, cereals, and live-stock. In upper Michigan and Minnesota we meet with some of the most productive iron and copper mines of the world.

The Southern Region.—Between the Ohio and the Gulf is a forest-growing region, though it has been largely cleared of its woodland and devoted in considerable part to the growth of cotton, which forms by far its most important staple and extends throughout the broad domain of the Gulf States. In the low marsh country bordering the Gulf rice is largely grown. Cane-sugar has long been a product of Louisiana, and tobacco takes the lead in Kentucky, the city of Louisville being the greatest tobacco mart in the world. The prairie region extends southward into Missouri and the States farther west, though southern Missouri is well wooded, and Arkansas is widely covered with forest.

The Rocky Mountain Region.—The far west region of the United States is largely made up of plateaus and mountains; a series of ranges running in a nearly north and south direction and rising into peaks from 10,000 to nearly 15,000 feet high. These rest upon a broad plateau averaging 5000 feet in height, crossed by mountain ranges of much greater height. The loftiest two of these, each with an average height of about two miles, enclose an immense space known in its several sections as the Columbian Plateau, the Great Basin, and the Colorado Plateau.

Great part of this is arid land, with very few localities available for farming purposes. Parts of it, however, are open to irrigation, and it is estimated that more than 30,000,000 acres may yet be made fertile as a result of the work now being done by the Government. Yet the greater part of it is an irreclaimable desert. This arid region, almost destitute of running water, has an area in the United States of 550,000 square miles and in Mexico of 500,000, making in all more than 1,000,000 square miles. It forms, therefore, one of the great deserts of the earth.

The Great Basin.—The central portion of the region named, embracing an area of over 200,000 square miles, is known as the Great Basin, from the fact that none of its waters make their way to the ocean, but are lost in interior basins or in the sands. This realm of desolation lies between the Wasatch range of the Rocky Mountains and the Sierra Nevadas of eastern California, and includes nearly the whole of Utah and Nevada and parts of Oregon and California. In its northeast corner is its chief body of water, the Great Salt Lake. In its southern part, near the head of the Gulf of California, is Death Valley, one of the most sterile and desolate spots upon the earth.

The Colorado Plateau.—Southeast of the Great Basin is the Colorado Plateau, traversed by the deep and famous cañon of the Colorado River, and almost wholly a region of hopeless aridity. It includes most of Colorado and a considerable part of Arizona, with sections of Utah, New Mexico, and southern California. The soil, while full of the elements of fertility, is made barren from lack of rain. When watered from the streams, or from artesian wells, it yields large crops.

The Columbian Plateau.—Between the Rocky and Cascade Mountains and north of the Great Basin, extends the broad plateau region known as the Columbian, it being traversed by the Columbia River and its tributaries. It includes most of the States of Oregon, Washington and Idaho. This is not a desert region like the others mentioned, much of its surface being well watered and yielding abundantly. Its mountains are densely clothed with timber, some of its trees, especially the lofty Douglas fir, being of great size.

Mining Products.—The arid region of the West, while little fitted for farming, is rich in mineral wealth. Gold, silver, copper and other minerals are found there in large quantities. Its yield of the precious metals has been estimated at over four billion dollars, and its copper product is large. Lead is abundant and there are extensive coal fields, as yet little worked.

The Pacific Slope.—The mountains lying west of the Rockies—the Sierra Nevada and Cascade ranges—are very high, with many snow-clad peaks between 12,000 and 15,000 feet in height. Still further west, near the Pacific, is a coast range of lesser height. Between these mountain ranges are valleys of exceptional fertility, including the wonderfully productive farm lands of northern California and southern Oregon. The western slopes of the Coast Range are well watered and heavily timbered, the giant redwood being one of the chief products. Commerce is also well provided for by nature in two great Pacific harbors, those of San Francisco and Puget Sound. The latter may fairly be called an inland sea, having an abundance of deep water and a large number of inlets suitable for harbors. The leading ports, Seattle and Tacoma, have grown into flourishing cities.

CHAPTER VIII.

THE GREAT PRODUCTS OF THE UNITED STATES.

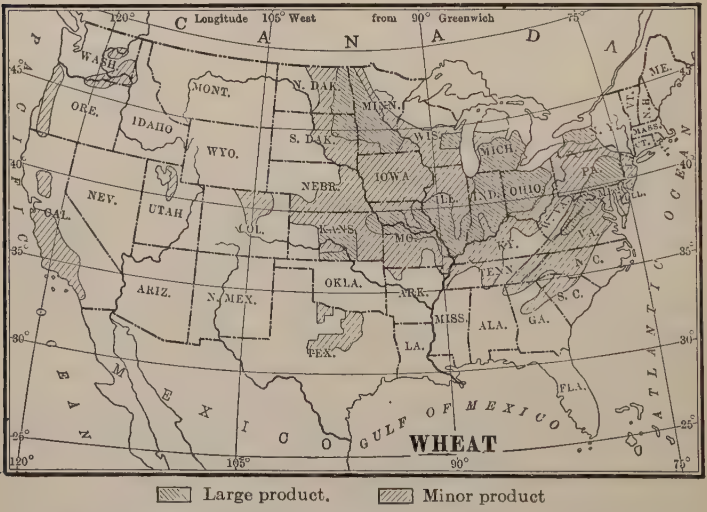
The Needs of Mankind.—When we speak of the industries of any country we have to consider them from two points of view. One of these is that of the production of food, an industry necessary to the life of man. The other is that of the production of clothing, furniture, habitations, and the many other things necessary to the comfort of man. We must begin with the first of these, since food comes first in the needs of human life.

Productiveness of the United States.—Nature has adapted the greater part of the United States to the abundant production of food, and this of the two separate kinds, vegetable and animal. There has been provided a vast expanse of fertile soil, on which all the products of the temperate zones can be grown. In addition are other vast areas of grass lands, on which cattle, sheep, and other food animals may feed and fatten. Thus this country is fitted for the support of a great population, one far larger than that which now inhabits it. In agriculture the land has not yet been made to produce half of what it is capable, yet its crops, especially those of the grains, are so large that there is abundant food, not only for its own people, but for many of those in other parts of the world.

The Wheat Plant.—Chief among the cereals, or grains, are wheat and maize—the latter usually known as Indian-corn. In the production of these two grains the United States stands first among the nations and aids largely in supplying the deficiency of the rest of the world.

Wheat is a product of the Eurasian continent, and was largely cultivated in ancient China and Egypt. While foreign to America, it thrives in the soil of its temperate zones, and can be cultivated through a wide range of temperature. It was brought here by the early settlers and taken by them to all parts of the country, making its way from the Atlantic to the Pacific. But the cooler parts of the country are best adapted to it, and maize largely takes its place in the more southerly sections.

Spring and Winter Wheat.—The great American wheat district is the rich prairie region of the West, the most prolific section being that fertile territory adjoining the Red River of the North. Here, on great farms, some of them covering from 25,000 to 30,000 acres, what is known as spring wheat—that planted in the spring—is produced in greatest abundance and of finest quality. Farther south, where the winters are less severe than in Minnesota and the Dakotas, what is known as winter wheat is planted, the seed being sown in the autumn. The winter wheat region includes the range of States from Ohio to Kansas and



Nebraska. Here the summers are too warm to produce grain of good quality, but by autumn-planting early harvests are assured, the crop being cut before it is injured by the heat.

Pacific and Macaroni Wheat.—Wheat is also grown in considerable quantities in the Pacific States. This is mostly winter wheat. It is chiefly ground in the States where it is raised, its export field being Japan and China, in which rice-producing countries a large demand for wheat-flour is growing up. A considerable addition to the area adapted to wheat has recently been made by the introduction of what is known as macaroni wheat. This is a variety suited to regions too dry for ordinary wheat, and fitted to grow in the great plains east of the Rocky Mountains. Some of its varieties are so hardy that they will resist the coldest winters. The product is not suited for bread-making, and is chiefly used for macaroni paste, so that the demand for it has so far been small and its culture is as yet limited.

The World's Wheat Crop.—The total annual wheat harvest of the world is over 3,000,000,000 bushels, of which the United States produces about one-fifth, its crop usually being somewhat less than 700,000,000 bushels. Russia, France, and British India are the other great producers, the Russian yield in 1909 being greater than that of the United States. Argentina, a country which has recently begun to grow wheat on a large scale, has now an annual crop of nearly 200,000,000 bushels, and is rapidly increasing its yield. Taking Europe as a whole, it produces somewhat more than half the world's wheat, but Russia and France alone raise enough for the home demand, and the continent has to buy about 500,000,000 bushels yearly. This is supplied by the United States, India, and some other countries.

The great European wheat product is secured by intensive farming, the fields being small and cultivation close and careful, so that the yield per acre is much larger than on the vast prairie farms of the United States. This intensive system of farming is pursued in the wheat fields of the older States, and in the future it will probably become general, with a large increase in the yield.

Flour-Making.—The wheat, when received from the farms, is stored at the great shipping points in elevators, or lofty warehouses, fitted with long spouts, by aid of which the grain can be easily delivered into cars and ships. While much of it is shipped in this way, every year more of it is ground into flour and sent to market in that form. The method of grinding the wheat has been much improved in recent years, the old millstones being replaced by rollers of porcelain or chilled iron or steel. It is run through a number of these, being reduced to flour by successive grindings. While this is being done, there are processes by which the bran, which would injure the sale of the flour, is removed from the grain.

Greatest among the flour-making cities of the world is Minneapolis, the great city of Minnesota. Situated at the Falls of St. Anthony, on the Mississippi, it has the advantage of an abundant water-power. The wheat fields are not far distant, its elevators are filled with millions of bushels of grain, the mills run night and day, and a yield of 100,000 barrels of flour in a week is usual. The improved flour made by the new modes of grinding has given rise to a large demand, especially from Great Britain, and a third of our wheat export is now ground before shipping. The methods of transportation have so improved that wheat from the far northwest can now be delivered in Liverpool at a cost of twenty cents per bushel, and flour with proportionate cheapness.

The Wheat Consumption.—The use of wheat has grown largely among the populations of Europe and America, many who once ate bread of rye and oats now eating wheat-

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Flour Mill District, Minneapolis.

bread. In consequence the consumption has largely increased and more than one-third of all the people of the world now use wheat to some extent for food. This number is yearly growing larger, and the coming of the rice-eaters of Japan and China into the wheat market may add greatly to the consumption. As each person needs about a barrel of flour, or four and a half bushels of wheat, yearly, the total consumption is necessarily enormous, and is running close to the annual supply. As regards the United States, the home demand is growing at such a rate that it seems as if before many years there would be none left to export, and the remainder of the world would have to look elsewhere for its supply.

Indian-Corn.—Great as is the product of wheat in the United States, it is small compared with that of maize, or Indian-corn, which for a number of years has yielded more than 2,500,000,000 bushels, and in 1906 gave the enormous total of 2,927,000,000 bushels. This plant is a native of America and was known to the Spaniards by its Indian name of maize, while the English settlers called it Indian-corn. This was a local adaptation of the word corn, which is used in Europe for the various grains, such as wheat, rye, etc. In this country only maize is spoken of as corn, the prefix "Indian" being dropped and the other grains known by their special names.

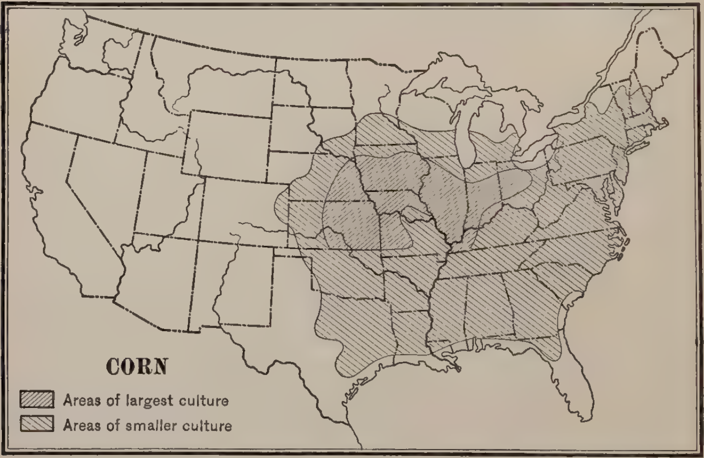
Indian-corn is a species of plant quite unlike those of the other grains, and bears its seeds in a peculiar manner, they being distributed in regular rows around an inner receptacle, the well-known "corncob," and covered by circular sheaths of leaves. It has a long, grassy stalk, usually seven or eight feet in height. The plant is not now known in a wild state. It is believed that a species of it formerly existed in China and the neighboring islands, but the only species now cultivated is the American one.

Where Corn is Used.—The Indians of the far past lived chiefly on meat and maize. The whites of America now use wheat and maize as their leading cereal foods. While maize, or corn, is not eaten very largely in the United States in comparison with wheat, in Spanish America, from Mexico to Chile, it is nearly the only cereal used as food. It has spread from America to the southern countries of Europe and elsewhere, and is much used for food in Italy and Roumania, and also in Egypt and India. The climate of Northern Europe is not suited to its growth, and it is imported into that region for use as animal-food.

The Growth of Corn.—Corn is not as hardy as wheat and needs a milder climate and a rich soil. It is a tender plant and frost is apt to injure it. It belongs by nature to the warmer climates, but the Indians adapted it to the colder north, growing it in New England, and now its largest growth is in the temperate zones. It must be planted late enough to save the young plant from frost, and it needs long summers and warm nights to attain its best results. To ripen it well, as the harvest season approaches there is needed a warm autumn with very little rain. Wet or very moist soil is not suited to it, and heavy rains are not desirable, as it absorbs much moisture from the atmosphere. Many varieties of corn are grown, a favorite one in America being that known as sweet corn, which is boiled and eaten in the green state and is so sweet and tender as to make delicious food.

The Corn Belt.—Corn thrives best in the warmer States of the Mississippi Valley, what is known as the "corn belt" extending from Ohio to the States west of the Mississippi, including Iowa and Nebraska, but not the colder States of Minnesota and the Dakotas. Nearly nine-tenths of the corn of this country and four-fifths of that of the world is grown within this area, Illinois and Iowa yielding the largest crops. While much is grown in the South, especially in Texas, the culture of cotton limits its area in that section. Corn is not planted in vast fields of many thousand acres like wheat, the average size of a Western corn farm being about 400 acres and those of the East being much smaller.

The Uses of Corn.—Corn is not as valuable as wheat, being less esteemed as an article of food, but it is wholesome and nutritious and is very largely used in some parts of the world. It is said that only rice is eaten by a larger number of persons. It is more oily, or contains more fatty substance, than wheat, and is therefore better for out-door workers, its heating power being greater. And it has the advantage of being useful for more purposes than the other grains. For human food it is ground into a flour known as corn-meal, which is used in various ways, including corn-bread, mush and other preparations. The grain is also cracked and eaten as hominy. Corn-meal mush is used in other countries, it being known as "polenta" in Italy, where it is the chief food of the peasantry, and as "mam-



aliga" in Roumania. A thin paste of corn-meal cooked into cakes yields the "tortilla," the national bread of the Mexicans.

Corn as Animal-Food.—The great use of corn in this country is not for human but for animal-food. It is fed very largely to hogs, and much of it given to cattle. This is the most profitable use that can be made of corn, since when converted into pork or beef it is worth five or six times as much as when used for human food. It has proved, therefore, much more profitable to ship abroad the meat of animals that have been fed on corn than to ship the corn itself.

Starch and Other Products.—Nearly all the starch used in this country is made from corn and this forms a large product, there being a number of factories which produce more than 20,000,000 pounds annually. Starch is also made from wheat, rice, potatoes, etc. Another corn product is glucose, or corn-syrup, the making of which consumes over 50,000,000 bushels of corn each year. It is much cheaper than syrup made from sugar, and is largely used in canning fruits, making candy, and for other purposes.

Whiskey is another of the products of corn, the cities of Peoria and Pekin, Illinois, being the largest centres of its production. The plant has uses aside from those made of the grain. Cattle will eat the corn-stalks, either dry or green, and when green they form a valuable food for dairy cows. The oil yields a substitute for rubber; smokeless powder and other explosives can be made from the pith; the husks are used for mattresses and some kinds of paper; and in corn-raising regions the cobs are often utilized for fuel. Thus no part of the plant need go to waste. Efforts have been made to teach the people of Northern Europe the value of corn as a food material, but as yet not with much success.

The Oat Harvest.—Though we look upon the oat crop as much inferior in importance to wheat and corn, it is in reality one of our great crops, much exceeding wheat in quantity. In some favorable years it has reached nearly 1,000,000,000 bushels in the United States. In fact, taking the whole world, more bushels of oats are raised than either of wheat or corn. The oat crop of Russia is about equal to that of the United States. Germany is also a large producer.

Oats are eaten as human food in the form of oat-cake and oatmeal porridge in Scotland and Ireland, and have come into use elsewhere in the form of prepared cereals or breakfast foods. But their great use is for horse-food, a well-fed horse eating nearly as much oats in two weeks as a man does of wheat in a year. Nearly all the oats raised in this country are consumed by its horses, the export trade being very small.

Other Cereals.—The remaining cereals, including rye, barley, buckwheat, rice, and millet, are of minor importance in American agriculture. Little rye is grown in the United States, and that produced is chiefly used for making whiskey; but it is grown largely in Russia and Germany, where the poorer people use it for bread. To our tastes it is not very palatable. We raise much more barley than rye, and much of this also is grown in Europe. Nearly the whole of it is used in the brewing of beer, and in Germany and England, where much beer is drunk, barley is an important crop.

Buckwheat is grown mostly in the States of New York and Pennsylvania, in the mountain regions, and is used for making the favorite buckwheat cakes. It is also of value in fattening hogs. Millet is a grass which is grown chiefly for hay-making in the United States and Europe, but its seeds are gathered in many parts of Asia and form the food of millions of people in China, India, and Japan.

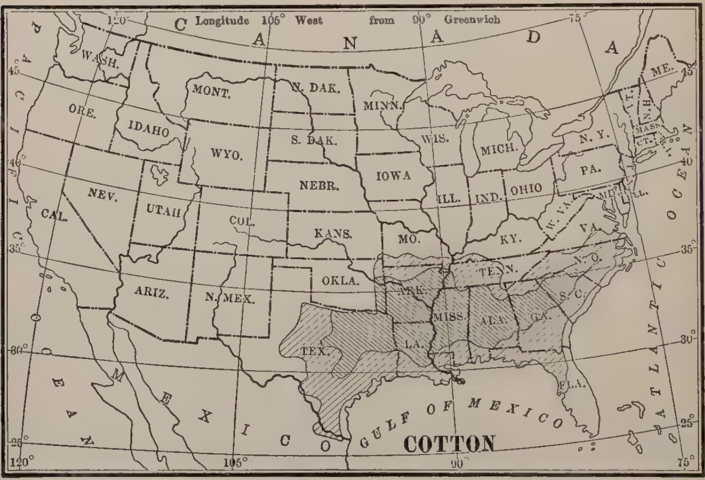
The Rice Culture.—Rice is a very important grain. While it is not grown largely in the United States, its culture is increasing. It takes the place of wheat in the countries of Eastern Asia and forms the chief food of nearly one-third of the human race. China, Japan, India, Burma, Java and other eastern countries are large rice-producers, and much is grown in other sub-tropical countries. It is largely cultivated in China, where it forms the chief food of the people.

In the United States rice is grown in South Carolina and the Gulf States. It needs much warmth and moisture and is mostly grown in low ground, where it can be flooded with water after it is planted. Thus the low, wet coast-lands of Louisiana and Texas are well adapted to it and about half the rice we use is now grown there. There is an upland rice grown in China, which needs less water, and which has been introduced into our country. After rice is threshed the grain is still covered with a husk, and in this form it is called "paddy" in India and Burma. It is apparently native to this region and its greatest growth is in India, where there are more than 60,000,000 acres devoted to rice.

CHAPTER IX.

COTTON AND OTHER FIBRES USED IN MANUFACTURE.

Valuable Farm Products.—Corn, wheat and oats are not the only great agricultural products of the United States. The hay crop, for instance, has a greater money value than the wheat, and serves as the chief winter-food of the grass-eating farm animals. Another product of high value is cotton, the great plantation crop of the Southern States. So highly is it esteemed that it was formerly known as "King Cotton," indicating that it stood at the head of all the products. And in export value it still deserves this name, for the money value of the cotton sent to foreign countries is nearly one-fourth that of the total exports from the United States.



▨ Areas of larger culture. ▨ Areas of smaller culture.

The Cotton Fibre.—The value of the cotton-plant lies in the cluster of white fibres which cover its seeds. These fibres are twisted together to make the threads from which cotton cloth is woven, and this cloth is worn as clothing all over the world. The cotton-plant, therefore, is to mankind one of the most valuable of all plants, since nearly half the people of the earth wear the cloth woven from its fibres. And it is interesting to know that the United States furnishes nearly three-fourths of all the cotton used for this purpose. But only a minor portion of it is woven into cloth in this country. England is the great cotton-weaving country and buys the greater part of the cotton grown in American fields.

Conditions of Cotton Growth.—The cotton-plant is not hardy. It needs a fair degree of warmth and will not grow in the Northern United States, its upper limit being about the thirty-eighth parallel of latitude. The soil and climate of the Southern States seem especially well adapted to it, and produce a grade of cotton not surpassed elsewhere in the world. The plant seems to thrive best near the seacoast and in regions of abundant moisture. Its largest yield is on the flood-plains of the rivers of the South. Each acre here bears about two bales, while on higher lands little more than one bale per acre can be harvested. The most valuable cotton grown is the sea-island cotton of the islands of the South Carolina and Georgia coast. This produces a fine, strong fibre about two inches long, while the general crop of cotton yields a fibre less than an inch in length.

Growth of Cotton Culture.—Cotton was found by Columbus growing in the West Indies and had long been manufactured into clothing in Mexico and Peru. The cultivated varieties came from India, cotton cloth being made in the East long before the Christian era. In the United States, though cotton was planted at an early date in the southern colonies, its progress was very slow. The lint or fibre clings firmly to the seeds and it took so much time to separate them that its production was costly. Slaves did the work, which was so difficult that one man could not clean a pound in a day. But in 1793 the cotton-gin was invented, and since that date this machine has been used to clean the cotton, doing its work so rapidly that it can take the seeds from 7000 pounds in the time that a pound and a half could be cleaned by hand. In consequence the cotton can be sold at a far lower price. Before the date mentioned the English had invented the spinning-jenny and the power-loom and could weave the cotton into cloth very rapidly, so that a great demand sprang up for the cheap American fibre. The cotton export from the United States began with 1200 pounds in 1784, and had increased to 20,000,000 pounds, or 50,000 bales, in 1801. A century later, in 1901, the export had grown to the great total of 6,000,000 bales, while 4,000,000 bales were used in the cotton factories of the United States. The greatest product, that of 1912, was 16,043,000 bales.

The Cotton Belt.—As we have wheat and corn belts in the North, so there is a cotton belt in the South, extending along the Gulf coast from Georgia to Texas, and in the central region from the Carolinas over Tennessee and Arkansas to Oklahoma. Of these States, Texas produces the largest crop, while Georgia comes next. The principal shipping ports are New Orleans, Galveston, Savannah and New York.

Plantation Work.—In raising cotton, the seed is planted about the 1st of April, while the growth is attained and the fruit begins to ripen about the 1st of September. This fruit is a round pod called a boll. After the seed has ripened the boll bursts open, revealing a thick bunch of white fibres which are attached to the seeds. The opened bolls are picked by negroes, who form the laborers on the plantations. Machines have been invented to pick the cotton, but hitherto none of them could do the work as well as the hand-pickers. It is now claimed that a successful machine has been invented. When gathered, the next process is to take the crop to the gin-house, where the fibre is separated from the seed by the cotton-gin. The cleaned cotton is then taken to the press-house, where powerful presses condense it into small bulk. In this way bales are produced of about 480 pounds each, being bound with hoops so that the form of the bale may be retained. This is the final process in preparing the cotton for shipping to the mills or to foreign ports such as Liverpool and Manchester, which are the greatest cotton markets in Europe.

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CHILDREN PICKING COTTON, ARKANSAS.

Foreign Cotton Fields.—The cultivation of cotton is by no means confined to the United States. It is still largely grown in India, its earliest known home, and still more largely in Egypt, where the product is rapidly increasing. Other cotton-growing countries are China, Korea, and

Turkestan, and parts of Africa and South America are also cotton-growers. Its culture was recently introduced into British East Africa and Uganda and promises to become large. All these countries send cotton to Europe, but the whole of them send less than one-third that from the United States. The cotton from the Nile is long and fine and brings a good price, being used for the best qualities of underwear. Brazil also produces long staple cotton.

Cotton Wharf, New Orleans.

But best of all is the sea-island cotton of the South, from which the finest thread and cloth are made. India cotton is a short staple and is used for coarse goods.

Cotton Manufactures.—Much more of the American cotton is used in the factories at home than was formerly the case. The New England factories have been steadily increasing their output for many years, and now there are numerous factories in the South, which get their cotton almost directly from the fields. The value of cotton manufactured in the United States has increased from $10,000,100 in 1880 to more than $50,000,000 at the present time. That now made exceeds in quantity that of any other country, though it is not as valuable as that of Great Britain, where the finest grades of goods are made. The coarser cotton cloths are produced so cheaply that they can be sold even to the tribes of Africa and other regions inhabited by uncivilized people.

Cotton-Seed Oil.—Within recent times important uses have been found for the by-products of cotton, especially the seed, of which several million tons are annually produced. This is very rich in oil, which is pressed from it, and is used for various purposes, most of it in the manufacture of lard and as a substitute for olive-oil. From the cotton stalks a fine paper pulp is obtained, which is made into the best writing paper. The cake, or meal, into which the seed is crushed is an excellent fattening food for cattle, and leads to the production of very rich milk.

Flax and Linen.—There are other fibres used for various purposes, some of vegetable origin, others of animal. One of these is flax, from which linen cloth is made. The plant is grown in this country for its seed. This yields linseed oil, which is used in mixing paint. Flax is grown largely in Europe, especially in Russia, for the fine and strong fibre of its stem. The linen woven from this fibre is used in the manufacture of table-cloths, napkins, handkerchiefs and many other articles, great quantities of which are imported into this country, where little linen has as yet been made.

Hemp Fibre.—Hemp is another plant which is grown in many countries for its fibre. Large quantities of it were formerly raised in this country, but other fibres have taken its place and little is now grown. Manila hemp, which is a native of the Philippine Islands, is one of the fibres which have replaced hemp, and heniquen, or sisal hemp, from Yucatan, is another. These plants yield strong, coarse fibres which are used in the making of rope, wrapping twine, canvas and bagging. From the finer grades of Manila hemp mats, carpets and cloth are woven. Manila paper is made from old, worn-out rope.

Jute, the fibre of a plant grown in India and China, is largely used to make the coarse material known as gunny-cloth, also sacks for wheat, rice and coffee. Ramie, or China-grass, a plant of Eastern Asia, but now grown in this country, yields a fibre from which carpets, mattings and rugs are woven.

Silk.—We have said that there are animal as well as vegetable fibres in common use. An important one of these is silk, the product of a caterpillar known as the silkworm. When this insect is near the end of its life as a worm it spins around itself a ball or cocoon of fine, glossy threads, making a warm, close nest within which it changes into a moth. In its caterpillar stage it is fed on the leaves of the mulberry-tree, which is cultivated for this purpose. To obtain the silk the cocoon is heated so as to kill the worm, and the thread is then reeled from it. In doing this several of the delicate threads are pressed together and adhere by aid of a gum which covers them. From the fibre thus obtained the most beautiful of cloths is woven. China, Japan and Italy are the leading countries in which the silkworm is raised, and in China and Japan great quantities of silk goods are made. Of those made in Europe and America the United States is much the largest producer, the centre of its manufacture being the city of Paterson, New Jersey. Pennsylvania and Connecticut have large mills also. The culture of the silkworm has always proved a failure in this country, as it needs cheaper labor than can be had here. So the raw material for these mills is all imported from abroad.

Woollen Goods.—The remaining animal fibre of which something must be said is wool, the curling hair of the sheep. Sheep are now kept in vast numbers in Australia, New Zealand, South Africa, Argentina, and on the western plains of the United States, and the annual wool-clip is a growing industry. Europe has long been a great sheep-raising continent and produces one-third the wool of the world. From wool the thickest and warmest cloths and

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GATHERING COCOONS—FEEDING SILKWORMS.

the best carpets are woven, and without the use of woollen clothing it would be hard to bear the climate of cold countries.

Woollen goods were the first fabrics woven in this country, being formerly made on household looms as "homespun" goods. They are now made in large mills or factories. These woollen mills are mostly in New England and the Middle States, Massachusetts producing most of the woollen, as it does of the cotton goods. Several countries surpass the United States in the amount of wool produced, and large quantities of it are imported to be woven in our mills, the annual value of the woollen goods made here being over $400,000,000. There is a large variety of goods made from the wool of the sheep, while goat's hair yields other varieties. Alpaca cloth is made from the hair of the alpaca of Peru, and the hair of the camel is used to some extent in the making of shawls and carpets.

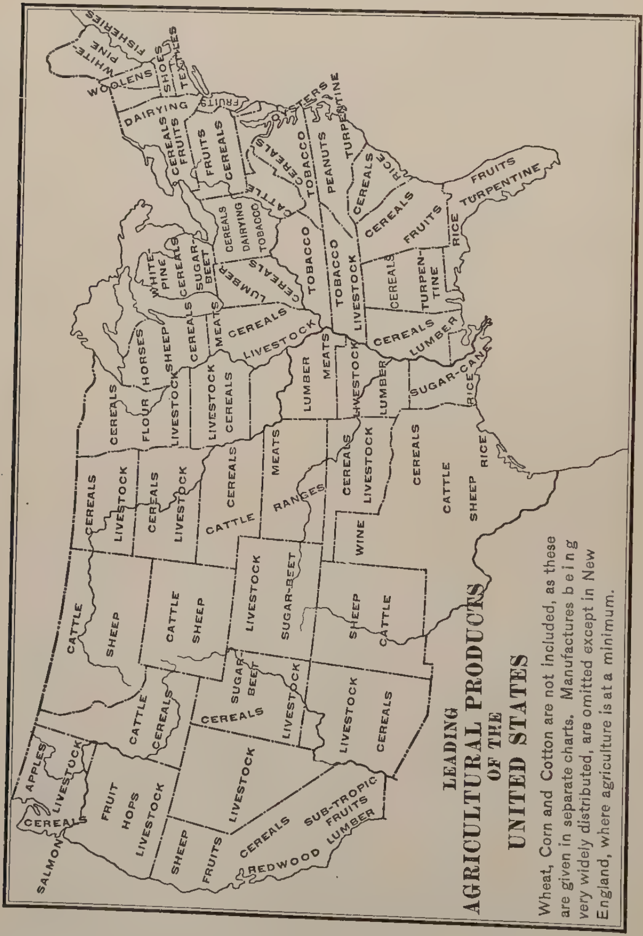
CHAPTER X.

OTHER IMPORTANT VEGETABLE PRODUCTS.

Important Food-Plants.—The soil of the United States and the world produces many other useful plants than those named, some of them of high value to mankind. Among these are sugar, coffee, tea, and various others everywhere used, including the potato, which forms a considerable part of the world's food. A description of those of leading value is necessary in any description of the industries of mankind.

Cane and Beet-Sugar.—In the consumption of sugar the United States stands at the head of the world, though by no means in its production. It, therefore, has to obtain much of this sweet viand from other countries, our annual sugar imports being valued at over $100,000,000. All the sugar used was formerly obtained from the juice of the sugar-cane, nearly the whole of it being made in the West Indies and the tropical countries of South America. But early in the past century it was found that some sweet varieties of the beet were rich in sugar, which could be easily extracted, and now more than half the sugar of the world is obtained from the sugar-beet. As this grows in the temperate zones, sugar is now a product of these as well as of the torrid zone.

Sugar Product of the United States.—The sugar-cane is grown to some extent in the warmer parts of this country, chiefly in the State of Louisiana, which yields over 300,000 tons of cane-sugar annually. The sugar beet is new to the fields of the United States but its growth is increasing in the northern and western States, Colorado, Michigan and California yielding the largest crops. Its product already exceeds that of cane-sugar. There is also a tree in this country, the sugar-maple, from the sap of which sugar is obtained. The yield, however, is small, and the sugar is chiefly used for confectionery or in the making of maple-



LEADING AGRICULTURAL PRODUCTS OF THE UNITED STATES

Wheat, Corn and Cotton are not included, as these are given in separate charts. Manufactures being very widely distributed, are omitted except in New England, where agriculture is at a minimum.

syrup. The islands lately added to the United States, Porto Rico, Hawaii, and the Philippines, are all producers of cane-sugar, the largest product being that of Hawaii, which yields over 400,000 tons annually.

Sugar of Other Countries.—Much the larger quantity of cane-sugar is made in foreign countries, especially in the islands of Java and Cuba, which are the great regions for this product. The leading beet-sugar countries are Germany, Austria, Russia and France. The total sugar product of the world is over 14,000,000 tons annually.

Loading Barge with Sugar Beets, California.

Sugar-Making.—The sugar-cane is classed with the high-growing grasses and is much like the Indian-corn plant in general appearance. It needs warm weather and will grow in any moist tropical region. The island of Cuba has long supplied the United States with cane-sugar, though German beet-sugar is now largely taking its place. The juice is obtained by crushing the cane between powerful rollers. The same thing is done with the beet, which is first ground to a pulp and then pressed. The juice thus gained is cleaned of impurities by filtering and other processes and then boiled until it becomes thick. It is finally drawn from the boilers into shallow pans, where the sugar crystallizes, the sweet liquid which remains being known as molasses.

Sugar when first obtained is of a dark color and needs to be refined to yield the white sugar used on our tables. This is done in large refineries situated in seaport cities, such as New York, Philadelphia and San Francisco. From molasses the strong drink called rum is distilled; much of it is purified and sold for use as table syrup. Glucose, a variety of sugar, is found in honey, in the grape and other small fruits. Much of it is made from corn and used in cheap confectionery.

Tobacco and Its Use.—The plant we have next to consider is of interest as being of American origin, though it has spread over the earth and is used by the people of all tribes and nations. This is tobacco, formerly used only by the American Indians but now a universal favorite, despite the fact that it is often injurious. It contains a very poisonous substance, nicotine, and when first taken to Europe its use was forbidden in several countries. But it soon became so popular that instead of forbidding its use, the monarchs collected heavy taxes on it. This is done even in the United States, where very few products are taxed.

United States' Tobacco Crop.—Tobacco can be grown alike in the torrid and the temperate zones. It is widely cultivated in the United States, from Connecticut to the Southern States, the great crop being that of Kentucky, which yields over 300,000,000 pounds, this being one-third of the total product of the country. Ohio, Virginia, and North Carolina also yield large crops. If we take the world crop, of about 2,000,000,000 pounds, one-third of the whole is grown in the United States. A large part of this is sent abroad, chiefly to Great Britain, in which no tobacco is grown; but the people of our country consume two-thirds of their product at home. This is mostly smoked in cigars or the pipe, or in the form of the cigarette. Used in moderation, it acts as a soothing narcotic, but its immoderate use is apt to produce serious results.

The Best Tobacco.—Though the United States produces the largest crop of tobacco, it does not produce the best. The choicest tobacco for cigars is that grown in the Vuelta Abajo district of Cuba. A very fine leaf is also grown in the islands of Sumatra and the Philippines, while the choicest tobacco for cigarettes is that raised in Egypt and Turkey. For use in the pipe the mild tobacco of Europe is preferred. Tobacco is also used for chewing and in the form of snuff. These are the most unpleasant methods and are much less practised now than formerly. At one time snuff-taking was highly popular among the gentry of Europe and America.

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Placing Tobacco on Drying Racks in the Field.

The best quality of Cuban-made cigars are known as "Havanas," though much tobacco from Porto Rico and Manila is used in them. As the duty on these is very high, much of the Cuban tobacco is imported in the leaf to Florida and made into cigars, mostly at Key West and Tampa. These are known as "Key West" cigars.

The Potato.—There is a third American product—in addition to Indian-corn and tobacco—which has made its way widely over the world and is in very common use as an article of food. This is the potato, a plant which produces a tuber, or starchy root-growth, and is of great importance to mankind. A native of America, where it was first used as food, it has spread far abroad, and is now a common article of diet in many parts of Europe.

Ireland was its first field of cultivation in foreign lands and it now forms the chief article of food used by the poorer people of that island. The same is the case in Germany, which raises more potatoes than any other country, the peasantry largely living on this American tuber. Great quantities of potatoes are grown also in Austria and Russia. While these are largely used for food, they are available for other purposes. Enormous quantities of the potatoes of Germany, France and Russia are used in making alcohol, which is used for fuel, lighting, and other purposes. Starch is another product of this useful plant.

The Sweet Potato.—The sweet potato is another tuber much used in the United States. It is not a potato at all, nor is it a yam, though it is often called by this name. But it is like the potato and the yam in being used as an article of food, while its agreeably sweet taste makes it a favorite with many. It is grown throughout the Southern United States and tropical America and extends widely through Southern Europe and Asia and Northern Africa.

The Coffee Plant.—Prominent among the plants that do not grow in the United States, though they are largely used there, is coffee. This is the seed of a tree which is supposed to be a native of Abyssinia, and the neighboring parts of Africa and Arabia. Yet the demand for it is so great that it is now grown in many parts of the tropical world. It needs a warm climate and therefore is not suited to the temperate zones.

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Coffee Leaves and Blossoms.

Coffee has been cultivated in Arabia from an early date and was used by the Mohammedans of that country as a stimulant long before it became known to the rest of the world. The "Mocha" coffee of Arabia is still considered the choicest variety, and next to that the Java. It was introduced into Java by the Dutch about 1680, and that island for many years supplied the world with most of its coffee. At present Brazil is the greatest producer of the plant and the chief supplier of the United States. Coffee is also cultivated in India, Madagascar, Liberia, and on the Guinea coast of Africa. In America it is grown not only in Brazil, but in other tropical regions of South and North America, and parts of the West Indies.

The Coffee Berry.—What we call coffee is the seed of the coffee tree. This bears a red berry smaller than a cherry and containing two seeds in a juicy pulp. When ripe the berries are picked and the seeds cleaned from their pulp. They are then dried in the sun and passed through a machine to take off their hulls. This is all that is necessary to prepare them for shipment. Coffee improves in quality with age, and formerly the Java coffee was kept for several years in storage before it was sold. As this was done by the Government, this coffee became known as "Old Government Java." This custom of storage is little practised in America. By roasting and grinding the coffee before use its strength and quality are much improved.

The Coffee Crop and Market.—Brazil produces more than two-thirds the coffee of the world, its exports being about 1,600,000,000 pounds out of 2,300,000,000 exported from all countries. The exports from all the American countries is almost 2,000,000,000 pounds.

The American coffees vary much in quality. While much of the Brazilian coffee—known in the trade as "Rio"—is poor, much excellent coffee is produced, the larger and finer beans being often sold as Java. Their flavor is so good that the difference is hard to detect. Honduras and Porto Rico also yield coffee of fine quality, and the "Oaxaca" coffee of Mexico is so excellent that it is sold as a choice Mocha. Ground coffee is often adulterated, chicory being largely used in England for this purpose. It does no harm and is thought there to improve the quality of inferior coffee.

The people of the United States are the great coffee-drinkers of the world. Of the total crop, nearly 1,000,000,000 pounds are used in the United States. Germany comes next, with 400,000,000 pounds. Great Britain and Ireland use the small quantity of less than 30,000,000 pounds, and this largely mixed with chicory. Tea is the favorite beverage in that country. While the American people use nearly eleven pounds yearly for each person, those of Germany use only about six pounds, and those of England less than one pound.

The Tea Plant.—The tea plant is supposed to be a native of India, since this is the only country where it is found wild. In its wild state it is a tree often more than thirty feet high, and with leaves eight or ten inches long. In its cultivated state its height is little above that of an ordinary bush and its leaf only two or three inches long. The plant is an evergreen, and it is an interesting fact that its value lies wholly in the leaf, tea and tobacco standing almost alone in this particular. Though native to India, the tea plant has been cultivated in China for nearly twenty-five hundred years and for many centuries has been a commercial product. Though in the use of tea our thoughts are associated with China as the great producer, at the present day India and Ceylon have the largest yield. The other principal tea-growing countries are Japan and Java. There have been efforts to introduce tea-culture into the United States, but little progress has been made.

The Preparation of Tea.—The tea leaves are picked several times a year. Only the youngest and tenderest leaves are plucked, the youngest leaves making the best tea. Each tree yields three or four pounds annually, and an acre of ground about three hundred and fifty pounds. After picking, the leaves are allowed to dry in the air until they begin to turn brown. Then they are rolled to press out the juice. This is done in China by rolling them on a table with the hands, but in India and Ceylon it is now done by machine rollers. The leaves are next dried slowly in the sun, this yielding "black" tea; or in pans over a charcoal fire, which yields "green" tea. The final process, after the leaves are sorted into different grades, is to pack them into wooden chests lined with lead. The finest Chinese tea is used at home. The coarsest consists of tea dust, stalks and refuse pressed into cakes or "bricks," which are sold to the Mongolians and the poor of Russia.

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GATHERING TEA LEAVES.

While the people of the United States are the greatest coffee-drinkers, those of the British Islands and Colonies are the greatest tea-drinkers. Australia stands first, with eight pounds yearly for each person; Great Britain next with six pounds. The United States and Russia consume less than a pound for each inhabitant.

South America has a tea of its own, known as maté, or Paraguay tea. This is the leaf of a species of holly which has the same stimulating quality as tea or coffee. It is all consumed in the countries where it is grown, the people of that continent being fond of it.

India-Rubber.—There is a vegetable product not produced in the United States but very largely used in it, since this country consumes about half the world's supply. We call it India-rubber; its Indian name is caoutchouc (pronounced kou′-chook). It has long been known, but for nearly a hundred years it seemed good for nothing except to make lead-pencil erasers. From this came its name of rubber. The overshoes made from it were so soft as to be of little use, but in 1844 Charles Goodyear learned how to harden it by mixing it with sulphur, and since then it has been of great use in many ways. Rubber shoes, to wear in wet or snowy weather, have become a necessity, and large quantities are used in making hose, tires for carriages and automobiles and water-proof cloth. And we must not forget the small elastic bands, which have so largely taken the place of string.

How Rubber is Obtained.—Rubber is prepared from the juice of a plant—or of more than a dozen different plants which grow in tropical regions all around the world. But the greater part of it comes from the forests of the Amazon River in Brazil and the neighboring countries. And this is a better material than the rubber of Africa and India. To obtain it, a cut is made in the bark of the tree and the sap caught as it flows out. This is thickened by heat and smoke. The maker dips a piece of wood into the gummy juice, holds it in the smoke until it hardens, and continues to do this until he has a large ball of rubber on his stick. The yearly crop of rubber is nearly a million and a half of pounds, of which the people of the United States use much more than those of any other country.

Gutta-Percha and Turpentine.—India-rubber is not the only gum obtained from the sap of trees. There are many others. One of these is gutta-percha, which comes from the East Indies and is prepared in much the same way as rubber. Its chief use is to cover the wires used in telegraph cables under the ocean. It preserves them and prevents the escape of the electric current. The sap of the pine tree yields other highly valuable products, especially the pine forests of North Carolina and other Atlantic and Gulf States. These yield two-thirds the world's product, Europe and India supplying the remainder.

The most important substance got from this sap is the very useful oil of turpentine, so much used in paints and varnishes. This oil is obtained by distilling the sap, and a solid substance remains known as resin or rosin, also of much use. When the resin is distilled the sticky material known as pitch remains, and tar is obtained by distilling pine-wood. These are known as "naval stores," tar and pitch being much used on the rigging and the decks and sides of vessels. There are many other resins and gums obtained from trees and used in the arts, but no others so important as those here named.

Edible Fruits.—It will be seen from what has been said that plants yield many things that are of use to man, partly as food and partly for other purposes. We have named the most important of these. There are many others of which we can speak only in a brief way. Of these the edible fruits are very numerous and highly esteemed. Chief among those grown in the United States is the apple, which is cultivated throughout the temperate zones of the world and can be kept for use during great part of the year. Others of abundant growth are the luscious peach, the juicy cherry, the pear, plum, grape, and the various berries. Those of semi-tropical character, suited only to the warmer

States, are the lemon, orange, pineapple, fig, apricot, and various others. To these must be added the nuts, including the almond, walnut, hickory-nut, chestnut, filbert, and the so-called peanut, or ground-nut, which is not a nut at all, but a pod-fruit like the pea.

The Banana.—We have named some of the more important fruits of the United States. There are many others, grown in foreign countries, some of which are imported into this country. The most important of these is the banana, cultivated everywhere in the warmer regions of the earth. In the lands of its growth the people largely live on it, it taking the place of the wheat and corn of colder climates. It is the most productive of food plants, since an acre of bananas yield 44 times as much fruit by weight as the potato and 133 times as much as wheat. Plants of the banana family are useful in other

10,000 Acre Orange Orchard, California.

ways, one of which is in producing the Manila hemp, which comes from a species of banana.

Cocoanut and Cocoa.—The cocoanut, the great nut yielded by a species of palm, is abundantly used in the United States and is a common article of food in tropical countries. It contains large quantities of oil, called cocoanut oil, which is used as food and in lamps. The leaves and wood of the tree are employed for various purposes, and the thick husk of the nut yields a fibre called coir which is of considerable value. Copra, the dried kernel of the cocoanut, is an important article of commerce in the islands of the Pacific. Thus, as may be seen, the cocoanut tree is of much service to man.

The plant known as the cocoa or the cacao has no relation to the cocoanut-palm, belonging to a different order of trees. It is a native of tropical America and is largely grown there and in the West Indies. Its fruit is of the shape of a cucumber and contains a large number of seeds, known in commerce as cocoa-beans. These, when roasted and ground into a fine paste are called cocoa. When mixed with sugar and flour and flavored with such substances as vanilla or cinnamon, this becomes the delicious substance known as chocolate. Used either as food or as a beverage cocoa or chocolate is an excellent heat-giving and flesh-forming nutriment, and in its ordinary state cocoa forms a valuable reserve food for travellers.

Vegetables and Drinks.—There are many other vegetable foods used on our tables, far too numerous to describe. They include such viands as peas, beans, cabbage, lettuce and other garden plants, and the spices, such as pepper, cinnamon, cloves, etc. Others are used in making beverages of different kinds, the intoxicating ones including beer, wine and distilled spirits, such as brandy and whiskey. Alcohol, which can be made from many plants, is the intoxicating principle in all of these. Wine is made from the juice of grapes, and brandy is distilled from wine and fruit juices. Cider, a common drink, is the juice of the apple, which becomes intoxicating when fermented. Hops, largely grown in Europe and the Western United States, are chiefly used in the making of beer.

Fruit Transportation.—In the days of our grandfathers the people of this country had to depend on their own orchards for fruit and the harvest of each fruit was a short one. In these days of swift transportation the harvest has become long. Fruit is brought to our tables by fast trains and in ice-chilled cars from all parts of the United States. The strawberry begins its season by coming from Florida and ends by coming from Canada. We have early peaches from the Georgia fields and late ones from upper New York. Apples reach us from Washington, cherries from California, melons from the Gulf States, bananas and other tropical fruits from the West Indies, and winter is fairly turned into summer on our tables by this wonderful transportation of the fruits of the earth.

CHAPTER XI.

FOOD ANIMALS OF THE UNITED STATES.

Food-Animals.—The food supplies which man obtains from plants, chiefly in the form of seeds and fruits, are not the only addition to his bill of fare which the earth offers. There are many animals which yield him food, most of them tamed and cared for by him, feeding principally on the grasses of fields which he has enclosed. Those we call cattle, the grazing-animals of the ox-tribe, come first, for they not only supply meat, but also the very desirable milk, butter and cheese. Next in importance are sheep and swine. The horse, another animal kept and fed by man, is prized for the work it can do, but is little used for food. Of the other animals of the field and farm the chicken is the most important as a food-producer, the eggs laid by it being invaluable to the cook.

The Cattle Range.—Cattle are kept in all parts of the earth, alike on the farm and on great grazing areas known as ranges. All regions of too little rain for the needs of the farmer, but with enough for the growth of grass, are very suitable for cattle and other grazing-animals, which are kept in large numbers. And they may be largely kept in areas fitted for farming if the population is too small to till the soil. Thus we find them in great numbers on the grassy pampas of Venezuela, the broad plains of Argentina, the steppes of Russia and Mongolia, the pastures of South Africa, and in many other lands where grass grows abundantly.

India, where meat is not eaten by the natives, has large herds of cattle, kept for their hides and milk, and as working animals. But among all the cattle-raising countries the United States stands first. Cattle are kept here for their meat and the milk and butter they yield. Our great cattle-raising country is in the broad, high, grass-grown plains of the west, from Texas to the far north. Here for many years great herds of cattle, of which thousands belonged to single owners, have been allowed to wander freely, each owner marking his animals with a special brand, so that he might know his own when "rounding up" time came.

Fencing in the Ranges.—The system of open ranges no longer prevails. The ranchers have found it to their advantage to fence in their ground and keep their cattle from the loose wandering of old. Wire-fences have been built all over that once open country, the top wire of the fence being usually made to do duty as a telephone conductor. This system of fencing has been adopted also on the broad ranges of Argentina and has proved much superior to the old method, in which the cattle were not well cared for and many of them were lost or stolen.

Loading Cattle in Hawaii.

The Market for Meat.—With more than 70,000,000 cattle on our farms and ranges, a market for the meat was needed, and this has been found in Europe, to which great quantities of meat are annually shipped from the United States. In many countries, as in Argentina and other parts of South America, the meat, in past years, could not be kept through an ocean voyage and most of it was wasted, the animals being killed for their hides and tallow. This great waste has been overcome since the new system of cold-storage was devised. Now meat can be shipped in a chilled or frozen state for the longest distances. Much is also preserved by canning in air-tight tins, and by salting or pickling. What is known as jerked beef is dried in the sun of warm countries and used in this state for food.

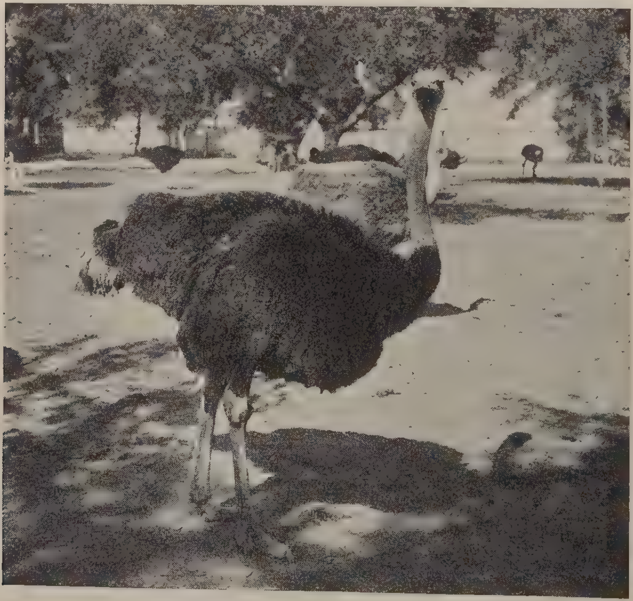
The Dairying Industry.—Of course all the cattle of our country are not raised on the western plains. Much the greater part of them are kept on farms, and here large numbers of cows, of the best milk-giving breeds, are used for dairying purposes. Milk and butter are products for which there is an immense demand. Butter was formerly made on the farm, but is now produced in large dairy factories in which the most improved processes are used. This country is now the greatest producer of butter and cheese in the world, more than 500,000,000 pounds of butter being made every year. This is used at home, as also our cheese, while we import many of the fine cheeses of Europe. Canada is the greatest exporter of cheese, and Denmark of butter, more than a thousand steam-dairies being kept busy in that small country. Great Britain buys more butter and cheese than any other country, most of the grass fields of that island being inclosed for gentlemen's estates.

Mutton and Wool.—While beef is the leading meat product of this country, mutton is largely eaten, and sheep are widely raised for this purpose and also for their wool, which is a more important product than their meat. More than 60,000,000 sheep are kept in the United States, and over half of these in seven States which border on the Rocky Mountains. Montana has the largest number and Wyoming next.

Sheep-raising is most profitable in dry, elevated regions where there is good pasture. Outside the United States they are kept in great numbers in Australia, New Zealand, South Africa, Argentina, and parts of Europe. There are various choice breeds, some being of value for their meat, others for their wool. Those of this country are nearly all of merino origin, the merino being a Spanish breed which has heavy and fine wool. The wool-clip here amounts to about 300,000,000 pounds annually, in addition to which we need to import 125,000,000 pounds for use in our woollen factories.

A SHEEP-GRAZING RANCH.

Swine.—Hogs are raised in this country in large numbers, probably a third of all the world's swine being grown here. These are converted into pork and lard, for which there is an immense market abroad. Thus the hog products which we export annually are valued at about $125,000,000, four times the value of the beef exports. Swine, as is well known, are not grass-eating animals, but are fed on various kinds of kitchen waste, and are very fond of acorns and beech-nuts, on which they largely live when allowed to wander in the woods. For fattening them corn is the best material, and of our great crop of corn more than a third part is used for this purpose. It is found to pay better in the form of pork than in its original form of corn. The work of killing and dressing hogs goes on very rapidly at our great packing centres, and their products can be sent abroad at a small cost for freight and preparation. And they are so carefully handled that no part of them is wasted.



An Ostrich Farm in California.

Poultry and Eggs.—Of the other food products of the farm poultry ranks high, both for meat and for eggs, the latter being used in vast numbers by the cook and the pastry-maker. The farm birds of this country, of which chickens form the chief portion, are very numerous and the eggs alone in the last census year numbered much more than a billion dozen. Great Britain is a large consumer of eggs, adding to the home supply about two billions of imported eggs yearly. These come from Russia, France, Denmark, Canada, and other countries. Other birds of the farm are ducks, geese, turkeys, and even the great ostrich, which has been introduced from Africa and is kept on farms in California.

Among the Cod Fishers.

The Fisheries.—We have mentioned above the chief land-animals consumed for food, but there are many water-animals of value for the same purpose, the product of our rivers, lakes, and seas, and of these something must be said. One of the greatest fishing regions of the world is that of the shallow waters near the coasts of Newfoundland and Nova Scotia, and here the fisherman of New England, Canada and France catch annually great multitudes of cod and herring. These are the most important fish caught there, but there is also a large yield of haddock, mackerel, halibut, and other fish. Farther south, in the rivers of the Eastern United States, the shad is taken in large numbers and is highly esteemed as a food fish.

The Salmon Yield.—On the Pacific coast the important fish is the salmon, the great resorts of which are the rivers from the Columbia to the streams of Alaska. Great shoals of them enter these rivers and they are caught in vast quantities. After being cooked by steam they are put up in cans, in which form they are shipped as a delicacy to all parts of the world. Most of the fish caught in the United States are consumed at home, but the salmon is largely exported to foreign lands.

Fish Hatcheries.—Formerly fish were caught by the fishermen with so little care for the future that the seas became nearly empty of some of the most valuable species, and it looked as if in the future the fish would be so few as to be not worth the trouble of seeking. The danger was so great that the Government was obliged to take control of the fisheries and to pass laws regulating them. There are now fish-hatching places where hundreds of millions of young fish are raised every year and put in the waters. In this way the supply has been largely restored.

Oysters and Lobsters.—No sea-product is more esteemed than the oyster, and very large numbers of this favorite shell-fish are taken along the Atlantic coast every year. The richest beds are those of Chesapeake Bay and Long Island Sound. Baltimore is the greatest oyster market of the world. Oysters are plentiful also along the coasts of Europe and on our Pacific coast; but these are of different species and not nearly so large and fine as those of the Atlantic waters of our country.

Another favorite sea-product is the lobster, formerly very abundant along the coast of New England, but now largely fished out. Most of our lobsters are at present imported from Canada, but steps are being taken to raise and plant young lobsters.

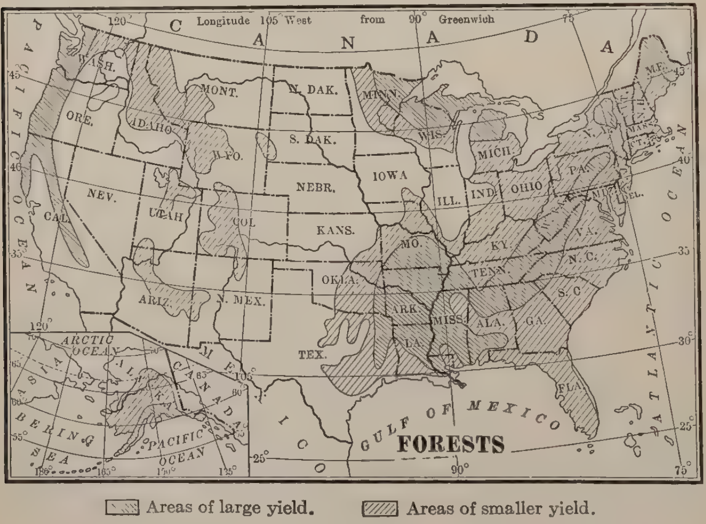
Foreign Fisheries. — There are extensive fisheries in many other parts of the world, especially Norway, where the cod and herring are abundant, and the British Islands, where vast numbers of herring are caught. The fisheries of France are also important, being among the best in Europe. Of other rich fishing fields we may speak of Japan, the waters of which empire of islands swarm with fish, which form a large part of the food of the people.

Furs.—Furs are found in all cold countries, where the chill winter temperature causes thick coverings of warm fine hair to be grown on animals. The Northern United States was formerly full of fur-bearing animals, but they have been trapped and killed so profusely that few of them remain. These include the mink, marten, beaver, and a few other animals. Canada has long been a great fur-hunting field, and still yields many valuable furs in its northern parts. Russia and Siberia are also rich in those animals. The most valuable furs now found in the United States are those of the fur-seal of the Pribilof Islands of Alaska. These have been largely reduced in number by over-hunting and only a limited number are allowed to be killed yearly.

CHAPTER XII.

FORESTS AND THEIR PRODUCTS.

The Trees of the Forest.—In former chapters much has been said of the food-products of the plant world. But plants are of use to mankind in many other ways than as sources of food. It is usually the smaller trees and the bushes that yield food-products and this chiefly in the form of their fruits and seeds. But their wood is equally valuable and there are multitudes of large trees from which no food is obtained, yet which man could not well do without. These compose the vast forests found in various parts of the world, and the smaller woods or groves of the farming regions, the whole yielding an enormous quantity of timber for man's uses.



The Uses of Wood.—Shall we say what the wood of these forest trees is used for? In fact, to the trees of the forest and to the metals of the rocks we owe the great bulk of everything we possess. Formerly our houses were built wholly of wood, and this is still the case in many parts of our country, and still more so in many other regions of the world. There are few buildings in which wood is not used and the furniture of houses is almost wholly made of it. Also the clothing we wear, table-cloths, mats, and many other fabrics are made of fibres obtained from wood. The paper on which this book is printed and the vast quantity of paper used daily in newspapers are all made of wood. And we might go on and on, speaking of the many ways in which wood is of use to man, but shall only say further that one great use is for the fires beside which he warms himself on winter days and nights. Though coal fires are common in our cities, large quantities of wood are burned for heating and cooking in many districts.

The Great Forests.—Trees grow freely in almost every region where man does not disturb them or where rainless deserts do not prevail. There are several great belts of forest which surround the land surface of the earth. One of these exists in the torrid zone, spreading out on both sides of the equator, and especially on the north side of this geographical line. It crosses the northern section of South America, the central section of Africa, and the southern section of Asia, the trees growing everywhere in dense groups and including many valuable species. Here are found such beautiful woods as the mahogany, ebony, sandal-wood, rose-wood, and others of ornamental character; the teak-tree, so useful in ship-building, the bamboo, rubber, and other trees of great value to mankind.

Going northward, we find a second belt which crosses our own country and the central and northern parts of Europe, and in which are numerous trees useful for building and other purposes. Here are pines, spruces, cedars, oaks, elms, maples, walnuts, hickories, and many besides. This belt extends northward to include the forests of Siberia, Canada, and Alaska, which are rich in coniferous trees,—that is, in the pines, firs, spruces, and other evergreen species.

Logging Camp in Maine Woods.

The Northern Woodlands.—The woodlands of the north temperate zone extend over a wide belt, reaching from about the thirty-fifth parallel of latitude almost to the Arctic circle. They cover great part of Siberia, Russia and Scandinavia, nearly a third of Canada and a fourth of the United States, and are the largest sources of commercial lumber, from the fact that they grow in or near the regions where most lumber is needed, and are thus the most available for man's purposes. It must be borne in mind that lumber products are heavy and costly to move, except where near water-courses, down which they can be floated, so that inland equatorial forests are of little value to the civilized nations. This cheap transportation of lumber is very important, and when the railroads of Argentina were being built ship-loads of ties were brought from far-off Australia, it being cheaper to bring the lumber needed from this great distance than to transport it overland from the Argentine forests.

Wasteful Use of the Forests.—The fact that the forests of the northern belt are so easy of access has led to a very rapid and wasteful use of their timber, the demand for which is immense. As a result, the forests of western Europe, except those of Sweden and Norway, have been largely cut down, and the same is the case with those of the United States, which once covered a great part of the country but now cover a comparatively small portion of it.

It is the recklessness of the lumbermen more than the needs of the people that has robbed our forests of their best timber. Fire has done more than the axe in destroying these noble forests. A woodland fire, left burning without thought, and fanned by high winds, may destroy in a few days enough of the finest timber to have lasted the country for a year. And where all the best trees are cut and none are replanted no forest can long stand the drain.

The Demand for Lumber.—Much wood is needed in civilized lands, for much is used. Though great quantities of coal are burned to warm the world's houses, a still greater quantity of wood is burned for the same purpose. And more houses are built of wood than of brick or stone. The railroads use enormous quantities of timber for ties. Other large quantities are employed in mines to hold up the rocks. Wood-pulp, which is needed for paper-making, consumes about 4,000,000 cords of wood yearly, one-fourth of which comes from Canada. These are some of the great uses of lumber, but there are very many smaller ones, and more than 40,000,000,000 board feet of lumber are used annually in the United States, valued at over $700,000,000. When we consider how great the demand is, what multitudes of trees are destroyed by forest fires, and how wasteful is the whole process of lumbering, we cannot wonder that our great forests are fast disappearing.

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LOADING PINE LUMBER, TEXAS.

Soft-Wood Lumber.—The demand for lumber is largely for the softer woods, those most easily worked for building purposes, and of these the white-pine is the most esteemed. Others in demand are the spruce and hemlock of the northern forests and the redwood of the California coast mountains. The white-pine, which was formerly abundant from Maine to Minnesota, has been cut down so rapidly that little of it remains, and the yellow-pine, or pitch-pine, of the South is now being largely used.

Spruce and hemlock are also valuable as lumber, while much of the wood-pulp is made from spruce, and hemlock bark is of great use in tanning leather. The redwood of the Pacific is a giant tree that yields excellent soft lumber. Farther north, on the mountains of Oregon and Washington, is the lofty Douglas-fir, a tough timber much used for the masts and spars of ships.

Hard=Wood Lumber.—Of hard-wood lumber, greatly in demand for furniture, tools, and cabinet-making purposes in general, there are many varieties in our forests, including the oak, walnut, ash, maple, hickory, and various other species. These are abundant on the southern Appalachian highlands and in the adjoining States and there is an extensive demand for their lumber.

The White=Pine. — Our most active lumbering region for many years has been in the States of Michigan, Wisconsin, and Minnesota, formerly almost wholly covered with the valuable white-pine. Year by year the axe of the lumberman has cut into the depths of these great forests; the saw-mill has followed to reduce the timber to marketable sizes; and the railroad has kept on their tracks, bearing the wood to its market. Wherever practicable, however, the cheaper method of water carriage is employed, and as these forests spread far around the lake city of Chicago, that city has grown to be the leading lumber market of the world. Of late years the dense forests of Washington and Oregon have become active lumbering areas, and the same is the case in the South, the pines and cedars of which are much in demand.

European Lumber Trade.—In most of Europe the trees have been so largely cut off that lumber has to be imported. Russia, Norway, Sweden, and Austria are the only countries that now have more lumber than they need, and large quantities are sent from these countries and from the United States and Canada to supply the European demand.

As for the vast equatorial forests, with their many valuable trees, no large demand for their products is likely soon to arise, on account of the cost of getting the lumber to the waterside. At present only the choicest woods are exported. In fact, the tropics have no soft woods like our pines, and much of our lumber is sent there, their mahogany, ebony, rosewood, logwood, etc., being sent us in return.

Lumbering.—In the practice of lumbering, a tree, to be suitable for cutting, should be free from branches or knots for fifteen feet or more from the ground. But the smaller trees and the parts unfit for lumber may be cut into ties for the railroads and these also often serve for wood-pulp, so that in many cases the ground is swept clean.

The trees are usually hauled on great sleds over the hard winter snows to some stream, and when the ice breaks in the spring they are rolled into the water and floated down to the mills. If the water is too far away, saw-mills may be set up in the woods and the timber cut up on the spot. Or the logs may be loaded on railroad cars and taken to the mills by train.

Preservation of the Forests.—If any of us were to see the methods usually pursued by lumbermen and the great loss through waste of various kinds, we could not but think that something ought to be done to stop this useless destruction. Yet it has gone on for many years, and only lately has our Government taken steps to save the forests. The nations of Europe have been more wide-awake. They saw years ago that no trees would be left unless something was done to save them, and now, in France, Germany, and Austria, the law forbids any one from cutting down a tree without planting another. The English have adopted a similar system in India. The results of this care of the forests are very important, some of those of Europe being so wisely handled that, though they supply more lumber than ever before, they are not decreasing in size.

In the United States something of the same kind is now being done. Thus on the prairies, which were formerly treeless, many thousands of trees have been planted. The custom of Arbor-Day has been established to teach the children in the public schools to plant and take care of trees. And the Government has now a Bureau of Forestry with the duty of diligently caring for the forests and preventing their destruction either by fire or heedless lumbering. The same thing is being done by several of the States, such as New York and Pennsylvania, and all are being roused to this necessity. The national "forest reserves," which have been set aside as public property, now cover nearly 200,000,000 acres. In these, and in the State reserves, the trees are being cut with great care and millions of new ones planted, so that the extent of national and State forests is increasing from this source.

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FLOATING LOGS DOWN WILLAMETTE RIVER, OREGON.

Conservation of Resources.—This care of the forests is part of the new system of conservation of national resources lately adopted in this country. The Government proposes to take strict care of everything we have of value, the woods and waters, the rivers and fisheries, and all else which nature has given us, and of which it is our duty to prevent wasteful usage. And among these the care of the forests is one of the most necessary, from the great value they have in many ways.

Forest Fires.—One thing very necessary to be done is to prevent forest fires, by which great numbers of trees are destroyed. Every summer, during the dry season, we hear of fires burning over thousands of acres and destroying millions of dollars worth of lumber. And these are mainly due to the carelessness of hunters, who leave camp fires smoldering, or to sparks thrown out by locomotives. Much care is now being paid to the prevention of such fires and to put them out when kindled, and this is one of the chief duties of the forest wardens.

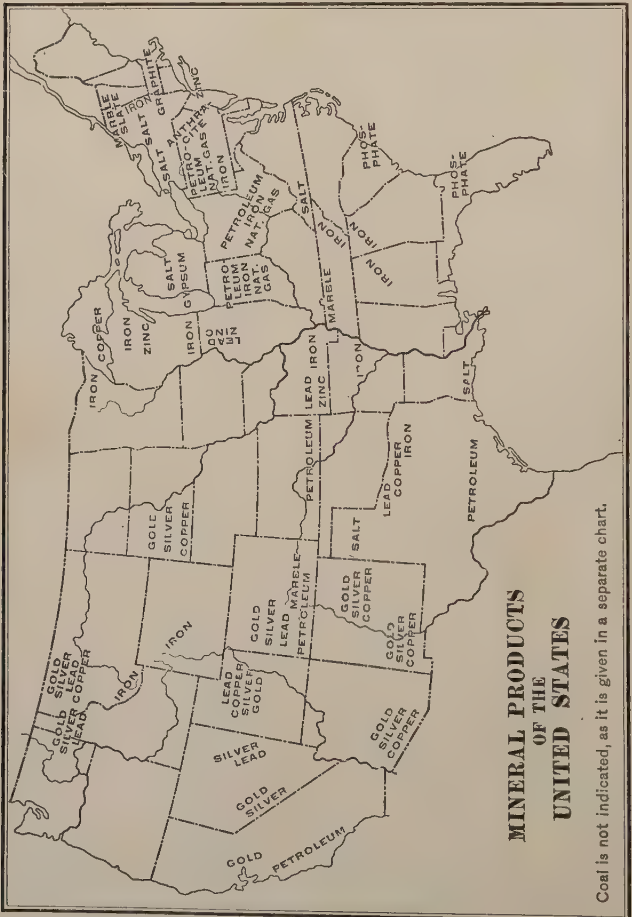
CHAPTER XIII.

METALS AND OTHER PRODUCTS OF THE ROCKS.

Surface and Underground Products.—So far we have spoken only of the products of the soil, the plants which are of so much use to man as sources of food and in other ways, and the animals which live upon plant products and serve man for food. This is what the surface yields us. But beneath the surface, often far below, are many other products of nature without which civilization could make little progress. When we mention among these such necessary articles as coal, iron, gold, silver, and other minerals and metals of daily use, it will be seen that this statement is well justified. Chief among these needful things are coal and iron, without which the progress of the nations would have been very slow.

The Uses of Iron.—Iron is far the most important of the metals to man. Fortunately it is one of the most abundant and easily procured. Its use is universal. We can scarcely turn without coming across some article made of iron or steel. From our pocket-knives to the huge steel plates forged for battleships it is used for articles of all shapes and sizes. The railroads consume vast quantities of it, steel being used for their rails and iron and steel for the locomotives and many of the cars. The demand for iron and steel for bridges is also great, while the iron ships and the steel-clad war-vessels of modern times use other large quantities. Formerly, in building, nails, bolts, and other small articles were the chief uses of iron, but now huge buildings are in large part constructed of steel. With these large and the multitude of small demands for this useful metal, it is evident that our need of it is very great.

The Supply of Iron.—Fortunately the supply of iron is enormous. It is found in the rocks of all parts of the



MINERAL PRODUCTS OF THE UNITED STATES

Coal is not indicated, as it is given in a separate chart.

earth. No other metal but aluminum rivals it in abundance, and this is no rival of iron in cheapness and fitness for many uses. Much of the iron of the earth is very thinly disseminated through the rocks and the soil, but in many places it occurs in great beds of ore. Yet not all these extensive deposits can be cheaply worked. Iron ore is oxide of iron, and the oxygen must be driven away before we can obtain metallic iron. To do this, heat is needed for cheap production and beds of coal must lie within easy reach. Thus the deposits of iron which can be worked to advantage are much fewer than might be supposed, and at present the lack of coal in the vicinity renders much of the iron of the earth of little utility to mankind.

The Great Iron Mines.—The most valuable deposits of iron in the United States are those found in various parts of the Appalachian Mountains and on the shores of Lake Superior. The Appalachians contain abundance of coal, while the Lake Superior ore can easily be transported in lake vessels to the vicinity of coal mines. For this reason these beds have been largely worked. Other large deposits are those of the Ozark Mountains of Missouri and those of the Rocky Mountains. These remain for future use. Apart from the United States, the greatest miners and smelters of iron and steel are Germany and Great Britain, but the United States produces much more than both of them combined, and in fact nearly half the total product of the earth. There are large deposits in some other countries, as in China, for instance, but so far they have been little worked, and the three countries named produce five-sixths of all the iron of the world.

The Lake Superior Mines.—Iron is mined in various ways, the cheapest being that practised in the Lake Superior region. Here the ore occurs at or near the surface and is very easily taken out. It is in so fragile a state that steam shovels are used to scoop it up, lifting several tons at a time and dropping their loads into hopper cars. These run on down-grade rails to the ore docks, where the ore is dumped into chutes and run into the holds of vessels. So rapid is the process that a large ship can be loaded in two or three hours and a small one in less than an hour. In this way the ore is cheaply transported to distant lake ports, the cost being much less than that of railroad transportation. It is cheaper to carry the ore to the coal than the coal to the ore, since it requires more than two tons of coal to smelt a ton of ore.

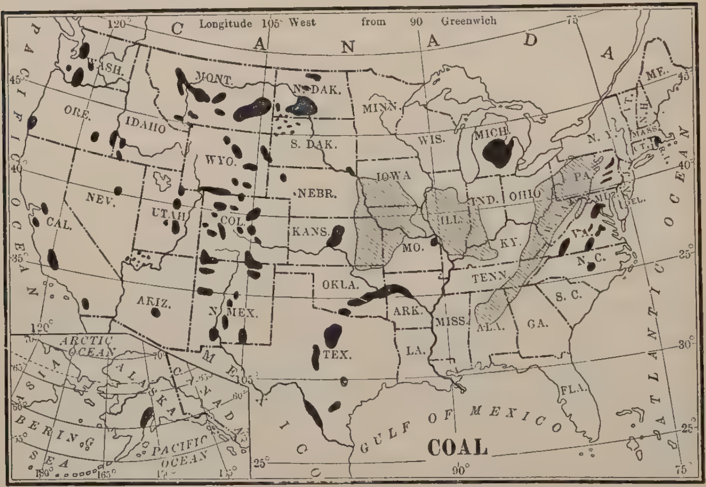
Unloading Ore at Erie, Penna.

Centres of Iron Production.—The original great seat of iron and steel production in the United States was the region near Pittsburg, a locality yielding iron and coal abundantly. While other centres have grown up, this still holds the chief place and Pittsburg has fairly earned the title of the "Iron City." But since Lake Superior ore has come largely into the market, several lake ports, such as Erie, Cleveland, and Chicago, have grown prominent as centres of iron manufacture. And the abundance of iron and coal in close propinquity in the southern Appalachians has brought several cities of the South into this field, especially Birmingham, Alabama, which has sprung into importance as a busy centre of iron-smelting and manufacturing.

Smelting Iron Ore.—In the smelting of iron three things are necessary, the presence of ore, coke, and limestone. The coke is made from coal, coke being better than coal for smelting purposes. The ore is crushed and mixed with the coke and limestone, and the mixture poured into tall blast furnaces. The coke is then kindled and is made to burn with intense heat by driving through it a blast of hot air. The limestone fuses with the silica in the ore and forms a fluid slag which floats on the top of the molten iron and is drawn off at an upper opening; the iron flows out at a lower opening into sand channels or steel molds, where it hardens into the long, rough bars known as pig iron.

Steel and Wrought Iron.—Pig iron contains a quantity of carbon, part of which must be got rid of when steel is to be made. There are several ways of doing this. The cheapest is the Bessemer process, in which the pig iron is melted and a blast of air driven through it. The oxygen of the air burns out the carbon. Then a sufficient quantity of spielgegeisen (a compound of iron and carbon) is added to supply the requisite amount of carbon. There are other and more expensive methods by which finer steel, suitable for cutlery, tools, and high grade machinery, is made. If all the carbon is burned out the product is called wrought iron. This is very strong and tough and is employed for rods, bolts and other articles which are to be subjected to a severe strain.

The Coal Fields.—As iron and coal are so closely associated, and the latter is of such great utility to mankind in several ways, an account of its occurrence and uses comes here in place. Like iron, coal is exceedingly abundant, being found in large deposits in many countries. The coal fields of the United States cover nearly 200,000 square miles and those of China and Japan spread over as great an area. Europe has about 50,000 square miles of coal fields and India 35,000. In some parts of these fields the coal occurs in veins of great thickness. In others it is too thin to pay for working. As a consequence little more than half of the coal area of the United States is



workable and much of that of other countries cannot be worked for the same reason.

The amount of coal mined every year in the United States is now little short of 500,000,000 tons, while Great Britain, with less than 10,000 square miles of coal area, mines about half as much, and Germany, with less than 21,000 square miles, mines over 200,000,000 tons. The product of other countries ranges from 40,000,000 to less than 1,000,000 tons, and China, with its immense beds, produces very little coal.

The Origin of Coal.—Coal, as most readers know, is not of mineral but of vegetable origin. In far past geological ages trees and bushes grew abundantly for millions of years and much of the vast supply of the vegetable material from these old forests sank into swamps and became covered with mud. Beds of rock gathered over it and pressed it downward, and in time, by the aid of heat, moisture, and pressure, this vegetable matter was changed into coal. There are now in many parts of the earth large deposits of such decaying vegetable material which are called peat-beds. When dried, peat makes very good fuel. If it were covered with rock and exposed to great pressure it would in time harden into coal.

The coal beds thus formed vary greatly in thickness. They are divided by layers of rock into what are known as veins, some of them ten or more feet thick, others only a few inches. A vein less than three feet thick is rarely worked on account of the difficulty and cost. These veins sometimes show themselves at the surface, but others are very deep. In some of the mines of England, which have been worked for many years, the remaining coal is so deep that it does not pay to mine and raise it to the surface.

Varieties of Coal.--Coal varies much in hardness, and is usually classed as hard and soft coal. The hard coal is also known as anthracite. This has been exposed to intense heat and pressure and is found only in small areas. It is the most valuable form of coal, being as compact as stone and burning with little flame but intense heat. The world's greatest deposit of anthracite is that of Pennsylvania, and from this over 80,000,000 tons are taken yearly. There are small beds of this valuable variety in Colorado and New Mexico, and others in Nova Scotia and England, but these yield very little coal. Anthracite coal also occurs in China, but no one knows how much.

The most abundant coal is that called bituminous. It is softer than anthracite, and burns with a bright flame and a great deal of smoke. It is widely distributed in the

United States, being found in abundance in Pennsylvania, West Virginia, and the range of States from Ohio to Iowa and Missouri; also in the mountains of the South. Nearly all the coal of Europe and Asia, so far as known, is of this kind. This coal is used for smelting iron, being first turned into a substance known as coke. This is done in kilns, or ovens, in which the gas is driven off from the coal and burned, leaving the remainder as coke. In city gas-works the gas is saved and conveyed by pipes to houses, the coke here being a by-product. In making coke coal-tar is produced, and this is very useful, yielding the aniline dyes, benzine, and other valuable substances.

Lignite and Cannel Coal.—Lignite, a variety of coal much softer than the bituminous, is found in a number of the States west of the Mississippi, but is as yet little used. Cannel coal, a glossy variety, may be highly polished and utilized for ornaments. It is much like jet in appearance. As fuel it is burned in open grates. It gets its name from the fact that a piece when lighted will burn like a candle until it is all consumed.

Graphite.—What makes coal so useful for burning is the fact that it is largely made up of the carbon of wood, and that carbon is very inflammable. A useful variety of nearly pure carbon is that known as graphite or plumbago. It is also called "black lead," because its chief use is in making lead-pencils. These were given this name because they were at first made of thin strips of lead, graphite being little used for this purpose before 1850. In making pencils the graphite is first reduced to powder. It is then compressed, clay being mixed with it to produce pencils of different degrees of hardness. Good graphite is found at Ticonderoga, New York, in Chester County, Pennsylvania, and near Ottawa, Canada. Most of that used comes from the island of Ceylon and the finest kind from a mine in Siberia.

Petroleum. — The buried relics of the forests of the geological times were not all employed in making our great mines of coal and our small beds of graphite. A minute part of the earth's carbon, possibly from this source, was crystallized into the lustrous form of the diamond. A considerable portion of it was converted into rock-oil or petroleum, of which extensive underground deposits are found in many parts of the earth. These, being liquid, do not need to be mined like coal. To obtain petroleum deep wells are bored into the earth, from which this useful material flows like water. Though it occurs in many regions, nearly all the petroleum used comes from the United States and from Russia, it being found in abundance near the Caspian Sea.

The wells of western Pennsylvania were the first opened and they still give a very large yield, but much has since been found in other States, especially Ohio, Indiana, and Texas. The total annual production of the world is over 260,000,000 barrels, of which the United States yields over 160,000,000 and Russia about 60,000,000. Petroleum was at first taken to the refineries and seaports in barrels. Then it was conveyed in iron tank-cars. Now it is sent underground through steel pipes hundreds of miles in length, through which it is driven by pumps.

Petroleum Products.—Much of the petroleum produced, such as that from Russia, Texas, and California, is used for fuel. That of Pennsylvania and the neighboring States is largely refined, this yielding the clear, water-like kerosene, or burning oil, which is in demand all over the world for lamp-oil. Some of this is sent abroad in tin cans, but most of it is pumped into great tanks in steamships and thus carried to foreign lands, to be pumped out again when port is reached. It is then transported in various ways to the inland places where it is needed.

In addition to kerosene, there are various other petroleum products. These include naphtha, benzine, gasoline, and other very inflammable substances, also paraffine, a waxy material used to make candles and to insulate electric wires. A lubricating oil is also made which is used for heavy machinery. Asphalt is another product, but this occurs naturally in various places, and the world obtains its chief supply from the famous "pitch lake" on the West India island of Trinidad and from another lake in Venezuela.

Natural Gas.—Last in this series of products from the vegetable life of geological ages is a kind of gas, which is found mostly in the petroleum regions, coming up from the depths of the earth when wells are bored for it. It is carried in pipes to manufacturing cities. Natural gas burns with intense heat and is well adapted for iron and steel smelting and also for glass-making. Much of it was formerly used for lighting and heating houses. But it has been consumed so freely that it does not promise to last much longer, many of the wells being exhausted.

The Precious Metals.—Returning now to the metals, there are two of these so highly esteemed by mankind that they are known as the precious metals. These are the yellow metal gold and the white metal silver, used since very early times as money and also as ornaments, they being everywhere admired for their beauty of color.

Gold.—Gold is found in very many parts of the earth, though rarely in abundance. In fact, it is its scarcity that makes it so useful as money. Its native place is in quartz veins in the rocks, but as these have been worn away by the forces of nature the gold has been carried down by the rivers and sunk into the sands and gravels on their bottoms. This is called placer gold and is obtained by miners from the dry beds of old streams. Placer gold was formerly very plentiful in California and Australia and still is in Alaska. But much gold is now mined from the native rock deposits, Colorado being the richest gold-yielding State of this country and South Africa the richest region of the world. Next to South Africa comes the United States, and Australia comes third. Despite the great quantity that has been mined, the world's product is increasing every year and of late years has been valued at over $400,000,000. A large quantity of this is used for jewelry, watch-cases, and other ornamental purposes, and much also is hammered into gold leaf and used for gilding. This cannot be used again and it is said that in the United States fifteen million dollars worth of gold is lost every year in this and other ways.

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HYDRAULIC GOLD WASHING, OREGON.

Silver.—Silver is much more abundant than gold and therefore its money value is considerably less. While gold is usually found as pure metal, silver rarely is, it being usually combined with chlorine, sulphur, and antimony. The great silver-producing countries are the United States and Mexico, each of these yielding about one-third of the world's supply. Of the silver obtained, not more than a fifth part is employed as money, the remainder being made into ornaments, or into silverware for table use. Much silver is also used in the photographic art. Jewelry and other wares of gold and silver are largely made in this country, nearly all of these being used at home. Much is also imported from Europe, especially from France, the French being very skilful in working these metals.

Copper Ingots Ready for Loading, Michigan.

Copper.—Another metal of much industrial importance is, fortunately, abundant in the United States. This is copper, of which this country produces more than half the world's output. It is found in several localities in the United States, the great yields being in Arizona, Montana, and Michigan. The Michigan mines are near the shores of Lake Superior, and are interesting for several reasons. The copper occurs here in the form of the pure metal, not combined with sulphur as elsewhere, and it was obtained and used by the Indians long before the whites came to America. It was the only metal they knew. The mines have been worked by the whites for more than sixty years and are now over a mile deep, being the deepest in the world. Copper is mined in many other countries, including Mexico, Canada, Chile, Spain, Japan, and Germany, the United States yielding annually about 400,000 tons and all other countries about 325,000 tons.

Uses of Copper.—Copper is useful in various ways. Combined with zinc it forms brass, and with zinc and some other metals it forms bronze. It was known in these forms in the far past, and the tools and weapons of old were made of bronze. Sheet copper is used in making boilers and for roofing, also for sheathing the bottoms of ships. But much the greater part of it in our days is used in making wire to convey electricity. Next to silver it is the best conductor of the electrical current, and is in great demand for telephone and electric light and power wires.

Lead and Zinc.—Lead is found largely in the Rocky Mountain region and in other localities, this country being the greatest producer. Spain comes next, and then Mexico and Canada. It is used for making water-pipes and lining water-tanks. Alloyed with other metals it forms shot, type-metal, pewter, and solder. But the greater part of it is used in making paint, as carbonate of lead, or "white lead," also as "red lead."

Zinc is also an American product, the United States being the greatest producer, Germany and Belgium coming next. In the sheet form it is largely used in our houses. Much of it also is employed to cover iron sheets, forming what is called "galvanized iron." Like lead, it is used in paints.

Other Metals.—There are several other useful metals, one of which, tin, is not mined in the United States, most of the supply coming from some small islands near the Malay Peninsula. There are mines in Cornwall, England, which have been worked since ancient times. It is used mostly in making tin-plates, which consist of sheet iron covered with tin. Nickel is found in Missouri, Canada, and elsewhere and is used for plating iron and steel, and also as money in our small coins. Added in small quantities to steel, nickel makes it much harder. Manganese, another metal, also gives hardness to steel.

Quicksilver, or mercury, is a useful American product, California supplying nearly half the total yield. It is interesting from being a liquid at ordinary temperatures. This makes it useful for thermometers and barometers and it is employed also in coating, or "silvering," the backs of mirrors. It is much used in dissolving and securing gold when this occurs in small quantities.

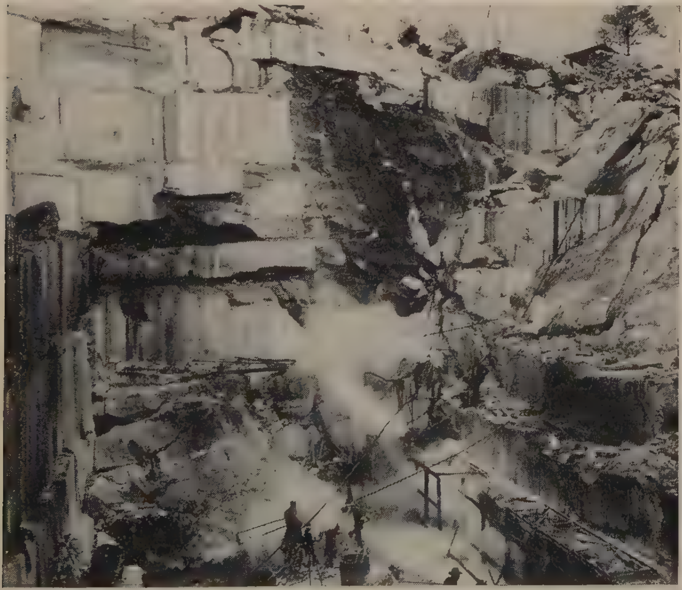
Aluminum is a very abundant metal, being the basis of all the clays. But it is very difficult to extract from the clay, powerful currents of electricity being needed. It is a very light metal and does not corrode in the air, so that it is coming into use for many purposes. One of these is to replace copper as a conductor of electricity. It is not as good a conductor as copper but its lightness gives it value, since a pound of aluminum has more surface and therefore is able to convey more current than a pound of the heavier copper.

So much space has here been given to the metals and fuel products, that nothing has been said of the other minerals of the United States, though these are numerous and of great value. Thus we have splendid marbles and fine granites and other building stones, clay in abundance for brick and pottery making, and various other valuable rock materials.

CHAPTER XIV.

PRODUCTS OF THE UNITED STATES COLONIES.

Outlying Provinces.—Within the past fifty years the United States has acquired, partly by warlike and partly by peaceful means, a number of outlying provinces, of interest as centres of production. These include Alaska, purchased from Russia in 1867; the Hawaiian Islands, annexed in 1898; and the Philippine Archipelago and the island of Porto Rico, ceded to the United States in 1896



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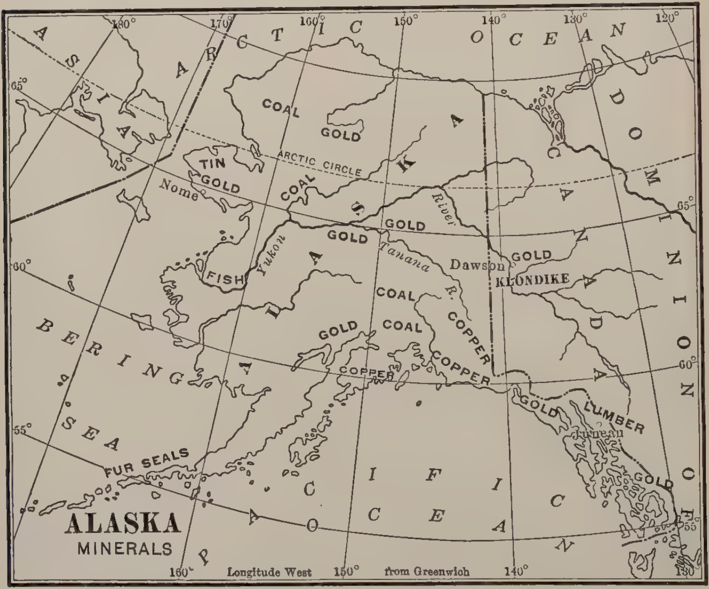
MARBLE QUARRY, TENNESSEE.

as results of the war with Spain. In addition are a few small island dependencies in the Pacific.

Alaska.—In the extreme northwestern section of America, far within the frozen zone, lies the extensive territory of Alaska, 577,000 square miles in area, though much the greater part of this large region is useless to us from the effect of the Arctic cold. When first bought, many of our citizens regarded Alaska as a mere expanse of frozen soil and accused the Government of wasting millions of dollars on a barren outreach of ice and snow. To-day we look upon Alaska with different eyes. Its gold, its fish, its furs, its lumber have proved of great value, and its iron, copper, coal, etc., are likely in the future to be of equal value. And Alaska is not all a throne of the frost king. The warm current of the Pacific sweeps past its shores and makes



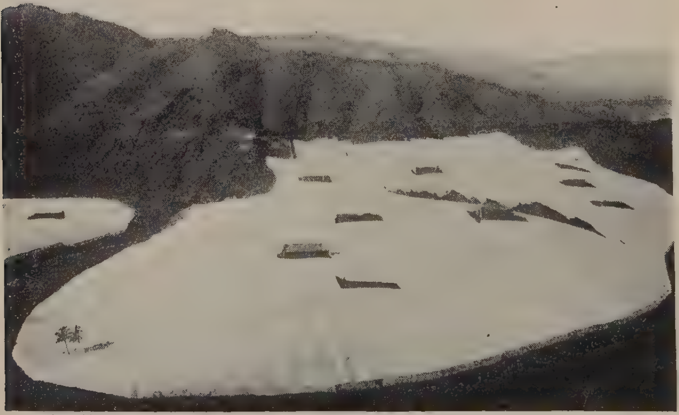
the section near the coast mild enough to bear forests of great extent, and to produce many of the garden vegetables of southern lands. Numbers of cattle also are raised on some of the islands.

The Wealth of Alaska.—The great value of Alaska, so far, has been its gold, its fish, and its furs. Many fur-bearing animals are found there, the most important being the fur-seals of the Pribilof Islands, in Bering Sea. Here are the most important sealing grounds of the world. The thick furs of the seals taken here are sent to London, where they are dyed a rich brown color and sell at high prices, both from their warmth and their beauty. The fisheries are still more important. The Columbia River, of Oregon, was formerly the greatest salmon-fishing stream of the world, but the waters of Alaska now surpass it, and the canning of Alaskan salmon has grown to be a great industry, they being sent all over the world. Cod and halibut also occur, and the annual fish-catch of the territory is valued at not less than $9,000,000.

The greatest value of Alaska lies in its mineral wealth. Gold was found along the Yukon River in 1897, and has since been discovered in abundance in the sands of the seashore at Nome. The yield of gold in Alaska at present is more than $18,000,000, being greater than that of any of the States except Colorado. Another product likely to prove of great value is coal. The mines are not yet worked, but are said to contain enough bituminous coal to supply the United States for centuries. There are also iron and copper in large quantities. and the marble quarries opened in 1904 are yielding some of the finest marble in the country.

Porto Rico.—If now we go south to the warm region of the West Indies, we find another outlying section of our country in the small but fertile island of Porto Rico. This island is smaller than the State of Connecticut, but contains more people to the square mile than any of the States except Massachusetts and Rhode Island. It is a land of farms, many of them very fertile ones. Much of the island is hilly, rising at places into low mountains, and less than a fourth part of it is under cultivation; but the plains near the coast are rich in soil and bear abundantly.

Climate and Products.—The trade-winds from the north-east blow constantly across Porto Rico and give it a more agreeable climate than the near-by island of Cuba. The rains also are plentiful and the farms yield largely. The leading crops are sugar, coffee, and tobacco, but fruits also are raised in abundance. Coffee is an upland plant and grows here on the hill-sides, the best of it on the higher elevations. The coffee-planters cultivate their shrubs with careful attention and produce a berry of fine flavor, and one which commands a high price. It is sold as a "Mocha" coffee, thus ranking with the finest brands, and is the most important product of the island. The yearly crop amounts to about 60,000,000 pounds.



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A TOBACCO FIELD COVERED WITH CLOTH FOR PROTECTION, PORTO RICO.

Sugar is also an important crop, this being grown on the lowlands adjoining the coast. As for tobacco, the best of this is raised in the hill country, though the largest plantations are on the low plains. Other products are rice and corn, with a variety of fruits. As coffee, sugar, and tobacco are not strictly food-plants, the island has to import much of its food, receiving provisions of various kinds from the United States and also many manufactured articles. It sends us annually about $25,000,000 worth of products and buys from us about the same quantity. It has little in the way of manufacture, but has a house-industry in the making of fine straw hats, somewhat like the Panama hats, many of which are sent to this country.

The Hawaiian Islands.—Far away from our shores, in a central position in the North Pacific Ocean, lies the fertile group of the Hawaiian Islands, recently annexed by the United States and now a Territory of this country. These islands, eleven in number, have a land area less than that of the State of New Jersey. While nearly twice as large as Porto Rico, they have less than one-sixth its population. The bulk of the people consists of natives, Japanese, Chinese, and Portuguese. The white population, American and British, is a small one, but owns about ninety-five per cent. of the island wealth.

Hawaii has an excellent geographical position, serving as a sort of cross-roads for the Pacific commerce of America, Asia, and Australia. The steamers from these distant lands find it convenient to stop at this mid-sea station, and large vessels from some of these countries may almost always be seen in the harbor of Honolulu, the capital, and the busy commercial centre of the islands.

Soil and Climate. — The Hawaiian Islands have been built up by volcanic action and contain the most remarkable volcanoes of the world. The surface is largely made up of lava, the disintegration of which has produced a highly fertile soil. Though located within the northern section of the torrid zone, the climate is not tropical. The islands lie in the highway of the Pacific trade-winds, and for ten months of the year these persistent northeast breezes bring here a temperature ten degrees lower than that of other countries in the same latitude. The interior is largely mountainous, and great part of the rains fall on the north side of the mountains. But usually there is enough rain in all parts for the growing crops.

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HAULING SUGAR-CANE.

Products of the Soil.—All the tropical products might be grown in the rich Hawaiian soil, but sugar has been found so profitable to its growers that it has become the principal product of the islands. In six of the eight inhabited islands sugar-cane is the leading crop and the annual sugar yield is nearly 500,000 tons, an amount of cane-sugar surpassed only by Java and Cuba. The sugar plantations are owned by stock companies, and very many of the people have bought sugar stocks, so that the rise and fall in the price of sugar is a serious matter to the Hawaiians. In the low, flat lands near the sea the Chinese have found an excellent opportunity to cultivate their favorite rice, and have developed the rice crop until it comes next to that of sugar. Nearly all of this is eaten on the islands, little being sent abroad. Coffee is also raised, so far on a small scale, but the berries are of fine quality. These are the principal crops, but many fruits grow on the islands and some of the abundant pineapples and bananas are sent to the United States and Canada.

Hawaiian Commerce.—Hawaii has two fine harbors, Honolulu and Pearl Harbor, the latter deep enough for the largest vessels afloat. Honolulu, on the island of Oahu, is a city of over 40,000 inhabitants, and has all the modern improvements of our home cities, such as electric lights, street railways, and well-constructed buildings. Its exports, consisting almost wholly of raw sugar, are large, having a yearly value of over $40,000,000, the sugar being sent to San Francisco to be refined for household use. In return, we supply the islands with about $15,000,000 worth of goods. As the forests of the islands have all been cut down to make room for sugar plantations, all the lumber needed is imported from the United States.

The Philippine Islands.—When the United States gained possession of the Philippine group, in the Eastern Pacific, it added to its territory a host of tropical islands, about 2000 in all. These comprise a dozen or so of large size and a multitude of smaller ones, most of them insignificant in dimensions. The total land area is about 140,000 square miles, about equal in extent to New England, with New York and New Jersey added. Two only are of very large dimensions, Luzon having 44,000 and Mindanao 34,000 square miles, but Negros, Panay, Samar, and several others are of considerable size. These islands are inhabited by somewhat less than 8,000,000 inhabitants, most of them with a degree of civilization, though over half a million are wild tribes, some of them utter savages. From north to south the group is about 1500 miles long, and from east to west about 650 miles.

Character of the Philippine Islands.—In the interior, mountain ranges traverse the large islands, some of them with volcanic peaks. Heavy forests, containing many trees of great value, cover the mountains. These include mahogany, ebony, sapan-wood, logwood, iron-wood, cedar (used for cigar boxes), and other kinds of valuable timber and dyewoods. The tough molave is especially valuable, as the white-ant cannot eat it and the sea-worm cannot bore it. It is used for the frames of vessels and would be excellent for railroad ties in the tropics. Bamboo grows everywhere and is used for a great variety of purposes, especially for building. Between the mountains and the sea are large areas of lowlands, mostly very fertile and capable of profitable cultivation. The climate is tropical and the rainfall abundant. The people generally are of Malay origin, most of them converted to Christianity by

Plowing a Rice Field in the Philippines.

the labors of the Spanish missionaries; though the warlike Moros of Mindanao are Mohammedans. The inhabitants of foreign origin number about 50,000, of whom about one-fourth are whites, the others Chinese.

Products of the Philippines.—Only about a third of the soil of the islands is fitted for agriculture, and the fertile section is cultivated to only a small fraction of its capacity. Its present product could be tenfold increased. As for the infertile mountainous region, its forests are of great value, and, being under Government control, cannot be wasted as our home forests have been.

The principal products of the islands are Manila hemp, sugar, and tobacco. The hemp is a fibre obtained from the leaves of a species of the banana, and is so strong that for rope-making it has no equal. Thousands of tons of it are exported annually, the plant being grown largely on Luzon and some of the southern islands. It is useful for various purposes besides rope-making.

Sugar and Tobacco.—The sugar made in the Philippines is exported in a very crude condition and is of little value when it leaves the islands. It brings a low price and is chiefly used in China and Japan. The best tobacco is that raised in the river valleys of northeast Luzon. It is highly esteemed in the East, the cigars made from it holding the place in eastern Asia that Havana cigars do in this country and Europe. The making of cigars and cheroots is the leading industry of the city of Manila, millions of them being made yearly to be sold in Eastern lands. Copra—prepared from the cocoanut—is also an export of value. Rice is raised largely, but not sufficiently to feed the people, much having to be imported. Another abundant article of food is fish, which are everywhere taken in large numbers.

Seaports and Commerce.—The capital and principal seaport is Manila, a large city, of about 300,000 population, and containing the bulk of the Americans and other foreigners. This lies on the shores of a splendid bay, large enough to hold the navies of the world. The other important seaports are Iloilo, on Panay, and Cebu, on the island of the same name. The exports and imports are nearly equal, being over $30,000,000 each, of which over $10,000,000 of each are with the United States. The imports consist of manufactured goods, the exports mainly of natural products, though large numbers of cigars are exported. Few of them reach this country.

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GATHERING COCOANUTS.

Mineral Products.—These islands have no large deposits of minerals, coal of inferior quality being the most abundant. It is mined in the island of Cebu, but occurs in large quantities in most of the islands. Placer gold is mined in Luzon, and iron, copper, and sulphur have been found, but very little of them has been mined. Under the stable government now being established by the United States the natural wealth of these islands is likely to be greatly developed and their population must increase.

American Stations in the Pacific.—In addition to Hawaii and the Philippines, the American possessions in the Pacific are small. One of the most important is the island of Tutuila, in the Samoan group. Its value lies in the fine harbor of Pago-Pago, one of the best in the Pacific, and used as a coaling and naval station. Another naval station is the island of Guam, one of the Ladrone Islands which was taken by the United States from Spain in 1898, at the time the Philippine Islands were acquired. There are a few other small islands over which the flag of the United States has been raised, but these have little or no value.

CHAPTER XV.

MANUFACTURES OF THE UNITED STATES.

Progress in Manufactures.—Agriculture, with which we have so far dealt, was the leading industry of the United States during its early period. Manufacturing industries were slow in developing, being forbidden by England during colonial times, and having to compete with the well-developed manufactures of England during the early national era. But the people of this country were eager to make things for themselves and their manufactures increased until they reached and in time far passed those of the British Islands and equalled those of the leading manufacturing nations of Europe. For example, in 1888, the estimate of production for Great Britain was about $4,000,000,000, while that of the United States had grown to $7,000,000,000. In 1900 the estimate for Great Britain, Germany, and France was $13,030,000,000, while that for the United States was nearly the same, being $13,014,000,000.

Manufacturing Advantages of the United States.—This great rate of progress was due to the fact that our people possess nearly all the raw materials of manufacture in great abundance, while other countries have to obtain many of theirs from abroad. Also, the sources of power—water-power, coal, petroleum, etc.—exist here in like abundance. It is, therefore, cheaper to manufacture our cotton goods at home than to send the raw cotton abroad and buy the woven goods from England, and the same may be said of various other branches of manufacture. Of the goods we make, the great mass are consumed in this country, so that it has been a decided advantage to have them made here, and thus benefit our home working-men instead of favoring those of foreign lands. As a result, huge factories and workshops of all kinds have grown up in the United States, and the roar of whirling wheels and clang of busy hammers may be heard in a thousand centres of industry.

Sources of Power.—There are several things upon which the development of a manufacturing centre depends. One of these is the nearness of the raw material. A second is the vicinity of sources of power. A third is easy means of transportation, both in bringing the raw materials to the factories, and in sending the finished products to the places where they are in demand. All these have their influence.

In the early days of this country water-power was everywhere used to move machinery, and as New England and the Middle States had many small mountain streams well fitted to turn water-wheels, this became the most active manufacturing region. Cotton was brought from the South to the New England mills, while the iron ore of the hills was smelted by aid of wood and charcoal obtained from our forests and converted into many much needed articles.

When it was found that the hills contained coal as well as iron, this new source of power came rapidly into use, and factories were built in many places distant from the water-falls. Though steam-power was dearer than water-power, it was a great advantage to have the workshop near the supply of raw material, or on the rivers or railroad lines by which the goods made could easily be sent to market. Thus factories sprang up in many places where no water-power could be used, and spread widely through the Northern States. And within recent years they have spread also in the Southern States.

Electric Power.—Still more recently another source of power has been developed, that of electricity, and the water-power of the streams has come into much of its old importance. By the use of long wires the electric power generated by water-falls can be carried for long distances and used in places where formerly only steam-power was available. In this way the force of the water of Niagara Falls is now made to move thousands of machines in Buffalo and more distant towns, and in other places the power of streams has been conveyed for use at distances of several hundred miles.

Centres of Manufacture.—In considering the origin of centres of industry we must bear in mind that localities in which manufacturing industry first becomes active are apt to retain the advantage given them by this early start. They have the buildings, the machinery, the capital, the skilled workman, and it takes time to overcome these. It was this that gave England so long the leadership in manufacture, though it had to bring much of its raw material across the oceans. This also has helped the New England cotton mills to retain the leadership in this country. It gave Pennsylvania the precedence in iron- and steel-making and made Philadelphia a great manufacturing city. Only of late years have other sections of the country come actively into competition with New England and Pennsylvania in these lines of industry. Thus cotton mills are now springing up in many parts of the South, and Birmingham, Alabama, has become prominent in iron manufacture.

The Leading Industries.—This review of the conditions aiding the growth of manufacture is important, as presenting some idea of the cause of the development of the many centres of the mechanical industries. The needs and demands of the people of this country have given rise to a large number of such industries, of which those relating to iron and steel and to textiles of various kinds are in the lead. The value of the product in these two fields of manufacture is nearly equal, though iron stands somewhat in advance.

Forging Armor Plate at Bethlehem Steel Works.

Iron and Steel.—The abundance of iron and coal, in close proximity, in Pennsylvania, brought that State at an early date into supremacy in iron- and steel-making, and the manufacture of machinery and other iron goods. This had much to do with the great industrial development of Philadelphia, which has abundance of coal and iron in easy reach. The manufacture of iron and steel goods is still largely pursued there, though the city is more notable at present as a centre of woollen manufacture. It has, however, the largest locomotive works in the world and in that city and its vicinity are the leading iron shipbuilding yards in the United States.

Interior of the Baldwin Locomotive Works, Philadelphia.

With the introduction of the Bessemer steel-making process the cost of steel became so greatly reduced that it could fairly compete with iron in the production of rails for railroad tracks and in various other purposes. The greatest steel-making works of the country grew up in the vicinity of Pittsburg and brought to that city immense manufacturing plants in iron and steel, so that it became known as the "Iron City." Within recent years rival works have grown up on the shores of Lakes Erie and Michigan, and also in the Birmingham district of Alabama. So greatly has this industry developed in the United States that at the present day its iron and steel product far surpasses that of any other country, and falls little short of being half the total product of the world.

Iron=Using Industries.—Iron is used in this country in the making of machinery of many kinds, for nowhere else has the machine so greatly taken the place of hand labor. One great field of machine labor is in the farming field, and now the work on the soil is very largely done by machines for plowing, mowing, seeding, reaping, threshing, and other kinds of farm labor. These tools of the farmer do their work with remarkable facility. Their use is not confined to our own fields, many of them being now employed by the farmers of distant countries. Such are a few of the purposes for which iron and steel are used. We cannot name them all. They range from a needle to a huge propellor shaft and from a wire nail to a great steel-framed building; and to think of even a small part of the things made of iron shows us how important this metal has become.

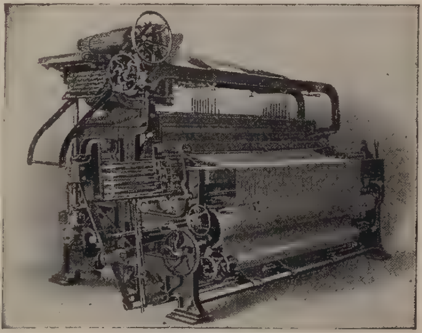
Textile Manufactures.—The manufactures of textiles are next in importance in this country to those of iron. By textiles are meant the goods made of the various fibres, such as cotton, wool, silk, flax, and hemp. These are employed in the making of clothing, carpets, and a great variety of other articles. In the past all this was done at home, our ancestors having spinning-wheels and hand-looms in their houses, on which the women wove the cloth for clothes and other purposes. It was hard work, as hard as that which the men had to do in the fields, and much relief was felt when machines were invented to do this work by water- or steam-power, and factories were built in which vast quantities of cloths, of various kinds, were cheaply produced.

Woollen Goods.—In the old "homespun" goods only wool was used, it being in those days cheaper and more easily worked than cotton. Even in factories it needs less expensive machinery, and large quantities of woollen goods are woven in the United States. These range from the finest kinds of dress goods to heavy clothing, felted goods, and carpets. Lawrence, Massachusetts, and Providence, Rhode Island, are leading centres in the manufacture of woollen cloth, while in carpets and rugs Philadelphia surpasses all the rest of the country.

Cotton Weaving.—After the invention of the cotton-gin, in 1793, and the great cheapening of this product, the manufacture of cotton cloth rapidly progressed. England, where the machinery for spinning and weaving had been invented, became the great cotton-weaving country, and still holds the supremacy. The United States comes next. New England was the first seat of American cotton mills and Massachusetts is still the leading State in this industry. But the South has of late years come actively into the field. Its mills have the advantage of being near the cotton fields and of employing cheap labor.

Use of Cotton Cloth.—The cloths woven in this country are chiefly of the cheaper varieties, the finest kinds being produced in England, though some fine goods are made in New England. Cotton cloth is worn as clothing all over the world except in the frigid regions, and the demand for it is very great. China and the other countries of Asia make a great market for it, and England stands far above all other countries as an exporter, the value of its cotton exports being above those of its woollen, iron, and steel goods combined. This is not the case with us, most of our cotton goods being used at home.

Silk.—The people of the United States make and use more silk goods than those of any other country in the world. They do not raise the silk-worm. That has been tried and found unprofitable. So they buy the raw silk in countries where labor is much cheaper, such as France, Italy, China, and Japan. About one-third of the silk exports of those countries comes to the United States, being usually received in silk skeins, just as it is unwound from the cocoons. Here it is spun into thread and woven into goods, or into silk ribbon or sewing silk, to both of which large factories are devoted. The largest ribbon mill in the world is in the city of Paterson, New Jersey.



A POWER WOOLLEN LOOM.

Flax and Hemp.—While much flax is grown in this country, it is chiefly raised for its seed, little of it being woven into linen. So our fine lawns, cambrics, and other linen goods are largely imported from Ireland, Holland, Belgium, and other European countries, the goods made here being mostly crashes, towels, and other coarse and cheap fabrics. Hemp was once raised largely here, but is now neglected. It is used for binding-twine and cordage. Other fibres in use for cordage, bagging, and coarse fabrics are Manila hemp, sisal hemp or heniquen, jute, and ramie, while plaiting straw is used largely in the manufacture of hats and bonnets.

Paper.—One of the great uses of wood-fibre is in the manufacture of paper. Formerly all paper was made of linen and cotton rags, worn out as clothing but very useful for this purpose. But the immense demand for paper in modern times has made it necessary to seek other materials, and at present much the greater part of our printing paper is made from wood-pulp, the fibrous product of spruce, poplar, and some other trees. These are ground down to their minute particles, which are converted into pulp by mixing with water. It is said that every two years an area as large as the State of Rhode Island is stripped of timber to supply the paper for our vast multitude of newspapers.

Printing.—Paper is used for a great variety of purposes and the quantity made every year is enormous. Its most important use is for the making of books and newspapers, and this has led to a wonderful development in the art of printing. Formerly all type was set by hand and for a long time printing was done on presses worked by hand-power. This was the method employed when Benjamin Franklin was in the printing trade and for long afterwards. Now we have great machine presses that will print, cut, and fold many thousands of large sheets of paper every hour. And type-setting by hand is giving way to machine type-setters, which make and set the types at the same time, and with great rapidity. As a result of all this, books are very much cheaper to-day than ever before, and where of old a single book was a prize, it is easy now to get at cheap rates all the reading we want.

Leather.—Shall we say something of leather, which is made from the skins of the animals we use for food? In past times these skins were worn as clothing just as they came from the animals, and this is still done in very cold countries. The Eskimos and Arctic travellers wear these skins, the fur being turned inside. In making leather out of animal hides, the first step is to remove the hair by the use of lime. The skins are then soaked in an infusion of oak or hemlock bark. This yields a substance called tannin, which acts on the raw skins and turns them into the durable article called leather. Leather is often colored after the tanning is finished.

Boots and Shoes.—Leather has many uses, as for harness, glove-making, bookbinding, etc., but its most important use is for making boots and shoes—chiefly shoes, for boots are now little worn. The United States manufactures more leather than any other country, using the skins of its own animals and many imported from South America. It is also the leading country in the manufacture of shoes. In place of the old hand-made shoes we have those of the factory, shoes being manufactured in vast numbers in large workshops, in which the work is done very rapidly by the aid of machines. This business, which has become an immense one, had its beginning in the city of Lynn, Massachusetts. It still has its headquarters in Massachusetts, though there are factories in many parts of the country. So rapid is the work in these factories that a pair of shoes have been cut from the leather and finished ready for wear in less than twenty minutes.

Other Articles of Manufacture.—The variety of articles made in the workshops of this country are much too numerous to mention. The great development of electric power within recent years has given rise to a large development of telegraph and telephone appliances, car and other motors, electric light apparatus, and electrical machinery of various kinds. Even electric locomotives have come and all our railroad trains may yet be moved by this power.

The use of carriages is fast giving way to that of bicycles and automobiles, the latter being now a very busy industry.

And the need of rubber for tires is providing work for the forest savages in the far interior of South America and elsewhere. Rubber is also used for boots and shoes, waterproof coats, and various other purposes. Before many years the aeroplane, or flying machine, may become another active article of manufacture.

Pottery.—The fine clays of the United States furnish the best of material for pottery, from the plainest kitchen utensils to the best porcelain ware. This very ancient art has developed in this country until the finest of vases and table ware, as well as a multitude of earthenware articles for everyday use, are made here.

Reproduced by courtesy of The Rookwood Pottery Company.

At Work in a Potter's Shop.

Small Articles. — The large articles of manufacture spoken of are by no means the whole that might be mentioned. There are many which are small in size but large in quantity. Thus there is the common article of buttons, of which many millions are needed. Needles and pins, of old hammered out slowly by hand, are now produced by hundreds of millions, and the number of matches used annually runs far into the billions. Pencils and pens are another type of small articles of which myriads are made. It is well to speak here of the watch, which has become a machine-made American product, and is turned out in great numbers in large factories with wonderful accuracy and cheapness. There are two immense watch factories, at Waltham, Massachusetts, and Elgin, Illinois, and each part of every watch made in them can be readily duplicated.

By-Products.—Modern manufacture is conducted on the principle of avoiding waste as far as possible. We have seen how use is made of every part of the cotton-plant. The same is the case with the waste of the petroleum refineries. The iron from old tin cans, once a nuisance, difficult to dispose of, is now changed into steel. The waste fat from the packing houses is converted into soap, glue is extracted from the heads and feet of animals, and fertilizers are made from the blood and offal.

The slag of the iron furnaces, once useless and got rid of at much expense, is now used in making cement, also in bricks and paving material. There is a process by which sawdust can be converted into an artificial wood of much value. All our paper was once made of rags and these are still used for the finer papers, but far the greater quantity of paper is now made of wood-pulp. The vast multitude of yesterday's newspapers, which nobody wants, now command a fair price for conversion into paper-box and other materials. Thus in our days there is little waste of anything that can be used, and every year we hear of some new process for the profitable employment of the waste material of manufacturing processes.

CHAPTER XVI.

THE AVENUES AND CARRIERS OF MODERN COMMERCE.

Interior Waterways.—In an earlier chapter the ancient methods of transportation were described, and the gradual development of the art of road-making and the carriage of goods from producer to consumer were spoken of. Here we must deal with this subject from its most modern aspect, as applied to the United States and other civilized countries.

In this country nature has done much to make transportation easy. The whole interior of the country is a vast plain, well adapted to the purposes of the roadmaker. And down its centre, from the north to the south of the country, runs the noble current of the Mississippi, with its branches spreading out like the limbs of a mighty tree. These give us in all about ten thousand miles of water, deep enough for boats to use, and much of it for ships to traverse. Here we have a splendid channel for inland commerce, one leading to ocean commerce by way of the Gulf of Mexico. And at Chicago and several places in Ohio are canals which connect these waters with those of the Great Lakes. Thus, by means of these inland waterways, cheap transportation may be had over great part of our country.

Other Navigable Waters.—There are other waterways of importance, both natural and artificial. These include the navigable rivers and great bays by which the commerce of such large commercial cities as Boston, New York, Philadelphia, Baltimore, Norfolk, Charleston, and Savannah reaches the sea, and that of Mobile, New Orleans, and Galveston reaches the Gulf. In addition are the Columbia and Sacramento Rivers of the Pacific States and the noble

San Francisco Bay and Puget Sound, invaluable for the commerce of the West.

The Erie Canal.—In addition to nature's provision of navigable streams are many artificial waterways, the canals made by man's labor, of which there are more than 2500 miles in the United States. The longest and most famous among these is the Erie Canal, 387 miles long, traversing the State of New York from Lake Erie, at Buffalo, to the Hudson River, at Albany. This great canal, built before the era of the railroad, has been of immense importance. Before it was excavated it took three weeks and cost ten dollars to transport a barrel of flour from Buffalo to Albany. By the canal it could be sent through in a week at a cost of thirty cents. Much of the traffic of the Great Lakes still traverses this canal, grain going east and merchandise going west, though the railways have taken much of the former canal trade. This canal is now being deepened to twelve feet, which will fit it for barges of 2500 tons carrying capacity. The Chicago ship-canal, running from Lake

TRANSPORTATION BY CANAL BOAT.

Michigan to the Illinois River, is deep enough to carry vessels needing fourteen feet of water, and may in time serve as a ship-channel from the Great Lakes to the Mississippi and thence to the Gulf of Mexico.

Other Canals.—Of the other canals of the country, many which were once of much benefit have been put out of use by the railroads, but the Ohio and the Miami and Erie, which connect Lake Erie with the Ohio River, are actively in use for the carriage of coal and ore. Taken together, these are nearly 600 miles long. The busiest canals in the world are the St. Mary's Falls Canal and the St. Mary's Canal, which connect Lakes Superior and Huron. About 25,000 vessels pass through them every year, carrying coal and iron ore chiefly, and with a tonnage three times as great as that of the Suez Canal. The St. Mary's is a Canadian canal, and another of importance is the Welland Canal, passing Niagara Falls and connecting Lakes Erie and Ontario. Canada has other important canals, the cost of the whole being nearly $100,000,000.

Panama Canal.—The greatest of all the canals of the earth, if we consider cost and difficulty of construction, is the Panama Canal, now being built by the United States through a ten-mile strip of territory ceded by Panama to this country. In this we have one of the greatest works ever undertaken by man, and one which promises to be among the most useful. Its cost will probably be over $400,000,000, but it will be worth its price, since it will shorten the water route between our Atlantic ports and those of China and Japan by more than 8000 miles. About fifty miles long between deep water in the bordering seas, the largest vessels now afloat can pass through it from the Atlantic to the Pacific, and the reverse. The least depth will be 41 feet and the least width 300 feet. In this grand work the United States has undertaken a task only surpassed in extent by that of the Great Wall of China.

Steam Transportation.—The most important means of transportation in our days is by the use of steam-power in the moving of cars and boats. Very soon after the steam engine was made available, efforts were made to move boats by its aid, and after various experiments a practicable steamboat was put on the Hudson by Fulton in 1807.

Steam Shovel at Work on the Panama Canal.

At a date not many years later there were steamboats on most of our inland waters.

The steam-carriage, or locomotive, was later in coming. The first railway for public use was the Stockton and Darlington, opened in England in 1825, and the first locomotive that gave general satisfaction was George Stephenson's "Rocket," of 1829. No time was lost in bringing this new means of transportation to the United States, where several short railroads were built by 1830, in which year the first American-built locomotive was tried. By 1840 there were nearly 3,000 miles of track, and the length increased rapidly after that date, reaching about 30,000 miles by 1860.

The increase continued rapidly after the Civil War, and by 1910 there were over 500,000 miles of railway in the world, of which more than half were in North America, and over 230,000 in the United States. This was a greater length than that of all Europe, which at that date had 175,000 miles. Over this American trackage, equal to nearly ten times the circumference of the earth, more than 60,000 locomotives draw 2,250,000 cars, carrying yearly 900,000,000 passengers and 1,500,000,000 tons of freight.

Railroad Service.—In the early days of railroading, small coaches were drawn by light engines over tracks made of lengths of flat iron spiked to wooden stringers. As time went on the locomotives and cars grew larger and heavier and stronger. T-shaped rails replaced the flat rails of the past. In 1865, at the end of the Civil War, a thirty-ton freight locomotive, hauling about forty cars holding ten tons each, was all the rails then in use could bear. Heavier weights would have shattered them.

When steel rails began to take the place of iron ones it was possible to add greatly to the weight of the locomotive without injury to the rails. Locomotives are now in use weighing from one hundred to over two hundred tons, while freight cars are in use of twenty tons weight and capable of carrying fifty tons. The passenger cars of our time weigh from forty to fifty tons and a speed of more than a mile a minute is not uncommon. This is a remarkable advance over the old horse-drawn carts and carriages which our ancestors used less than a century ago. Where a ton was a heavy weight for a horse at a walking pace on the roads of that time, one of our great locomotives can haul more than 4000 tons at a speed of twenty-five miles an hour.

The Railroads of To-day.—The railroads of our country have cost the vast sum of $14,000,000,000. They cover the eastern section of our country so thickly that a modern railroad map looks like a spider's web. The western section, largely made up of mountains, has proved difficult for railroad engineers, yet there are six lines extending from the Atlantic to the Pacific, and one in Canada, with a second partly completed. These routes are of great aid to commerce, since the teas and silks of China and Japan, instead of making the long water voyage around Cape Horn, can now dash across the Pacific in swift steamships, rush in fast trains over the American continent, and be landed in brief time in New York or in the ports of Europe.

Who owns these railroads? Many thousands of our people, we may answer, for their stocks are held by rich and poor all over the country. Most of them pay good dividends out of their profits and people with money to invest are glad to buy these stocks. There are plenty of them for sale, for the stocks of our railroads are valued at more than $7,500,000,000. In Germany, France and several other European countries the governments own great part of the roads. This is not the case in England and the United States, where the roads are owned by the people and managed by great companies of rich capitalists. At first each railroad had its own separate company, but these have been combined until now all the important lines are controlled by great organizations. As for the United States Government, it does not own any railroads.

Electric Railways.—Street travel in our day is almost wholly done in cars moved by electricity, and these have spread outward from the cities into the country until in some localities people can travel hundreds of miles by electric power. And these cars have begun to carry freight as well as passengers, bringing the product of the farm into the city. This is not all. Great electric locomotives are now being built to haul railroad trains. These have been used for years in Baltimore and are now in use in New York to haul trains in and out of the city, and also through the great Pennsylvania Railroad tunnel, which runs under the city and the two rivers which bound it. The time seems coming when steam railroad traffic will be at an end and electric traffic will take its place in all parts of our country.

Ocean Transportation.—We have so far spoken only of inland transportation, which is conducted by railroads over the land surface and by boats and vessels on the rivers and canals. The horse, which once did all the hauling, has been relieved of great part of its labor, but has much to do still in city streets and on country roads; and the oar and sail are still in use on the rivers, in competition with the steam engine and propellor. If, now, we seek the ocean and observe how transportation is conducted there, we find that as great progress has taken place as on land.

From Hosmer's History of Mississippi Valley (Houghton & Mifflin Co.)

AN OHIO FLAT-BOAT.

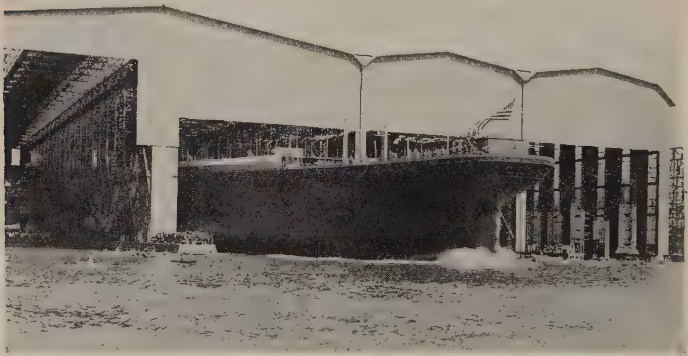
In the far past the oar was used as the chief means of moving vessels. Such was the case with the ships of Phœnicia, Greece and Rome, in which slaves were used to handle the oars. Coming to a much later date, when the daring sea-kings of Scandinavia made their way to Southern Europe and to America, the oar and the sail were both in use. But at the time of Columbus only the sail was used in ocean voyages. This held its own until about a century ago, when the steam engine began to take its place.

Types of Sailing Vessels.—Two types of sailing vessels came into use, the large ship with square sails for long voyages, and the sloop and schooner, with fore and aft sails, which could be handled from the deck, for coast traffic. In our days schooners large enough to cross the ocean and with more than two masts, some of them with as many as seven, have come into use. These are more easily managed than the square-sail ship and do not need as many sailors.

Steamships.—But the steamship has now largely taken the place of the sailing vessel for ocean traffic. Its power is far greater than that of the winds and its rate of speed is much superior. In 1819 the first ocean steamship, the Savannah, crossed the Atlantic. But this pioneer vessel used sails as well as steam, and took on board its paddle wheels when there was wind enough for sailing. Not many years passed before ships of this kind did without sails, trusting to steam alone, and in 1840 the first line of steamships, the Cunard, was established between Boston and Liverpool. This line is still in active operation.

The early steam-vessels were crude affairs compared with the floating palaces of the present day. Side paddle wheels were used on almost all of them up to 1860. After this date the screw-propeller, invented by John Ericsson about 1840, came rapidly into use, and within the last half century has completely taken the place of the paddle wheel in ocean traffic and almost completely in river traffic. Most of the great steamers of the present day use two propellors instead of one, and some use three, moved by powerful engines or steam turbines and driving huge vessels across the seas at a speed not dreamed of in the past. The Cunard line, the pioneer line of steamships, has the largest and swiftest vessels afloat, the Mauretania and Lusitania, each 790 feet long and of 33,000 tons burden. Of these the Mauretania has crossed the Atlantic from Queenstown to New York in less than four and a half days. In 1856 the fastest steamer took more than double this time.

These fast ships are passenger steamships, of which many lines now cross the Atlantic. There is another type, the great freight-carriers, with broad beam and great holding capacity, built to carry an immense load of freight at a slower speed—about nine or ten days for the voyage. It is in these ships that much of our enormous commerce crosses the ocean. Improvements in the steam engine have reduced the cost so greatly that it now takes scarcely more than twenty cents to transport a bushel of wheat from the Dakota fields and land it on the docks at Liverpool.



Launching an Ocean Steamer, at New York Ship Building Company's Works.

The great steamers have not driven sailing vessels from the sea. These out-number the steamers still, for they carry at lower rates all kinds of freight that do not need great haste, and cheapness often counts more than speed. But they are much smaller and their carrying power far less.

Light-Houses and Beacons.—The great increase in ocean traffic within recent years and the swiftness with which steam vessels dash across the seas, calls for great care to avoid danger of wreckage. At all points of peril light-houses are erected, flashing their signals all night long, and beacons are set within harbors to give warning of danger at night. Channels of deep water are marked by anchored buoys, some arranged to ring a bell as the buoy is moved by the water, others to whistle as the waves compress the air. Some also are fitted with lights to indicate their position at night.

Wireless Telegraphy.--One of the most important aids to modern navigation is the wireless telegraph. This has been improved until its signals can be sent for many hundreds of miles, and vessels can easily communicate with each other at sea, or send news to shore, receiving tidings in return. In times of danger this system is of the utmost value. In January, 1909, when the steamship Republic was rammed by another vessel and was fast filling with water, it summoned ships to its aid from all directions by its wireless plant, and vessels came rushing from all quarters to its assistance. As a result all on board were saved.

CHAPTER XVII.

HOME AND FOREIGN COMMERCE OF THE UNITED STATES.

Home and Foreign Commerce.—The word Commerce has a double significance. On the one side it indicates home or domestic trade, the exchange of goods between the people of any country. On the other side it takes the form of trade with other countries, near or far. In all nations domestic commerce is the more active. The people of any country supply their own wants first, then send the products for which they have no home use to other countries, from which they obtain goods not produced in sufficient quantities, or not at all, in their own land.

United States Domestic Commerce.—The United States is so wide a country and has so great a variety of soil and climate that it can produce nearly every thing its people need. They might get along without dependence on other countries, but as they produce much more than they can consume they are very willing to send this extra supply abroad and bring back products which are made more cheaply in foreign lands, or tropical fruits and materials which they cannot produce. Among these are such useful substances as coffee and tea, rubber and chocolate, silk fibre, and certain articles of manufacture which it is not desirable for us to make. It pays us best to buy these things and to spend our time in making the articles which we can produce most cheaply and easily.

New American Products.—Some of the things which we used to buy abroad we now produce at home. At one time Sicily supplied us with lemons and oranges. Now we grow more of these in Florida and California than we need.

Raisins, figs, prunes and olive-oil are also now raised on our own soil. We once bought all our wines in Europe; now millions of gallons are made in this country. In fact, we supply so many of our own needs in our fields and factories and have so much to spare, that we sell to foreign lands much more than we buy. That is, to use technical terms, our exports are much greater than our imports.

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Picking and Packing Lemons, California.

Exports and Imports.—During the years of the present century the value of our exports have ranged from about $1,400,000,000 to $2,200,000,000 a year; that of our imports from $900,000,000 to $1,700,000,000. Here is a surplus of about $500,000,000 every year, making a large balance of trade in our favor. That which is not paid for in goods must be paid for in money, and this is what is meant by balance of trade. A country is certainly growing rich fast when the rest of the world is paying it $500,000,000 a year in money for its excess of goods. It must be said, however, that the balance of trade in our favor is growing less, since our exports are largely the products of the cotton field and the farm. and these are being needed at home by our increasing population.

Trade with Europe.—When we look abroad for our customers, we find much the greater part of them in Europe, which buys three-fourths of all we have to sell. And of the whole sales to Europe one-fourth goes to the small British kingdom. Of these sales much the greater part consists of the fleecy product of our Southern cotton fields. This the manufacturing natives of Europe must have for their weaving mills. Next in quantity come the food substances, which they need to feed their workmen. Of manufactured goods sold abroad those made of iron and steel stand first in value.

Our World Trade.—While we sell such quantities of cotton to Europe, we have no trade there for our cotton goods, though these are sold in many other parts of the world, as also are our boots and shoes, petroleum, farming machines, tools, and other articles. Among our good customers our next-door neighbor, Canada, comes next to Great Britain and Germany, the great manufacturing nations of Europe. Mexico and the West Indies are also good buyers. In South America our best customer is Argentina, and in Asia, Japan buys the most. Australia also uses large quantities of our goods. We sell to many other nations, but to most of these only small quantities.

Source of Our Imports.—The things we buy are as varied as those we sell. We are good customers of Great Britain, Germany and France. Next to these come Brazil and Cuba; the first with its coffee and rubber, the second with its sugar and tobacco. Canada finds us a good customer, with its wood-pulp, and also Japan, with its silks and teas. Of all countries Switzerland has the largest balance of trade against us, as it sells us nearly $25,000,000 worth of goods, and buys less than $1,000,000.

South America and the West Indies send us, in addition to the articles mentioned above, cocoa, rice, cinchona, hides and other articles, and Mexico and Central America supply coffee, rubber, vanilla, dyewoods, sisal hemp, etc. More than half our imports come from Europe, but these are not products of the soil, like those mentioned, but are largely manufactured goods, such as gloves, ribbons and silk fabrics. We may name also scientific apparatus from Germany, steel pens and cutlery from England, linens from Ireland, friction matches from Sweden, jewelry from France, art objects from Italy, etc.; also partly worked materials, such as woollen yarns and silk threads, to be made into cloth in our factories.

SPONGE EXCHANGE ON WHARF, KEY WEST, FLORIDA.

Every other country sends us some of its distinctive products. Tea and silk come to us from China and Japan, tea and rugs from India, coffee from Java, tobacco from

Sumatra, carpets from Persia, spices from the islands of Malaysia. Australia's abundant flocks supply us with wool and hides. From the great continent of Africa as yet very little comes to us, though Egypt sells us annually over $10,000,000 worth of goods. We even buy cotton from Egypt and from some other countries, though we produce so much of our own. The cotton of Egypt is a long fibred kind, which we need for certain purposes. So far our exports to Africa are light, but much machinery is sent there.

Growth of Commerce.—Within the life-time of most of us there has been a very great increase in the exchange of goods among the countries of the world. The time was when each nation depended almost entirely upon itself. Now no nation does so and commerce among the nations is growing with striking rapidity. The world's commerce has doubled within the past forty years, and that of the United States within the past twenty years. Our dealings with foreign countries—sales and purchases—now amount to more than $3,000,000,000 a year. Our home sales to one another are twenty times as great as this.

Means of Transportation.—This vast movement of goods needs great activity in the arts of transportation and constant improvements in methods and facilities. We have already spoken of our means of inland transportation—our rivers, canals, and railroads; also of the host of sailing vessels and steamships that carry goods of all kinds to and from this country across the great oceans of the earth. Something more may be said on this topic.

No other country can compete with the United States in the length of railroad lines, and few equal it in the cheapness with which freight is carried. Great Britain has one advantage in its small size, since none of its large manufacturing cities are more than fifty miles from a seaport.

Yet we have factories a thousand miles from the sea that can sell goods in foreign ports as cheaply as those of the British workshops. Low freight rates aid us to do this. In like manner the wheat fields of Dakota, much more than a thousand miles from the sea, can compete with the wheat of Argentina, which has to be carried overland less than a hundred miles.

Whaleback Vessel in Canal Lock, Sault St. Marie.

Railroad Lines.—The most important of our railroad lines are those that run east and west. These pass through the greatest centres of agriculture and manufacture and reach the leading seaports of the Atlantic coast. As has before been said, six of them extend across the continent to San Francisco, Seattle, and other Pacific ports. These are the Great Northern, the Northern Pacific, the Chicago, Milwaukee & St. Paul, the Union and Central Pacific, the Southern Pacific, and the Atchison, Topeka and Santa Fe. Thus there is abundant railroad connection of our inland trade centres with the seaports of both coasts, and of the Atlantic and Pacific ports with each other.

The lines running north and south are of less importance, but the Southern States are now growing so active in agriculture and manufacture that their business is steadily increasing. There is also a growing trade with Mexico and South America which helps these lines. Very likely the opening of the Panama Canal will be a great aid to them.

A SCENE IN NEW YORK HARBOR.

Ocean Traffic.—This inland traffic is the great feeder of our ocean traffic, which in recent years has grown so greatly. Into the great seaports pours an endless flood of useful goods of all kinds, to be loaded on shipboard and sent to distant lands or to other American ports. We have in all about 25,000 steam and sailing vessels in active employment. But most of the trade along our own coast and a great part of our foreign trade is carried in vessels built abroad. This is because ships can be built cheaper in foreign ship-yards, labor and material being lower-priced there than in our own.

New York.—Our greatest seaports are those on the Atlantic coast. These face Europe, and thus are nearest to our best customers. Largest of these, and next to London among the ports of the world, is the great commercial city of New York, splendidly situated on an ample harbor and sending abroad about fifty freight-carrying steamers each week. A third of all our exports and more than a third of all our imports centre in this city. The food exports of the country have their chief outlet in New York. The same is the case with coal oil shipments, and cotton is another large export. Into New York comes the greater part of the cloths and wines sent from Europe, the coffee and rubber of the tropics, and many other articles. Manufactures have grown in this large city until now it stands first also in this field of industry

Other Atlantic Ports.—Boston, which comes next to New York in commercial activity, and was at one time the leading port of the United States, has large shipments of leather, cotton and wool, and also of Western food products. Philadelphia, the third port in importance, has the disadvantage of being 120 miles from the sea, but the Delaware River is being deepened to fit it for carrying large vessels. It has lines of steamships to several foreign ports and imports large supplies of wool for its carpet factories, of raw sugar for its refineries, etc. Its manufactures are very extensive, including the largest locomotive works in the world.

Baltimore is 160 miles from the sea, but is not far from the great Chesapeake Bay, and has a very large trade in corn, flour and tobacco, while its wheat shipments come next to those of New York and Boston. It is the largest oyster port in the world and also handles the fruit of a large and fertile region. Norfolk, near the outlet of the Chesapeake, is the great pea-nut market of the world, and Charleston and Savannah are important centres in the handling of cotton and field produce.

New Orleans, on the Mississippi, 107 miles from the Gulf of Mexico, has the largest cotton shipments of the world; Galveston, on the coast of Texas, coming next. Mobile handles most of the tropical fruit brought from the region around the Caribbean Sea and also has a large lumber trade.

Ferry Boat of Southern Pacific R.R. Benica, California.

Pacific Ports.—The most important sea-port of the Pacific coast is the large city of San Francisco, admirably situated on its splendid bay and having the Pacific Ocean for its trade outlet. It has an extensive and valuable trade with China, Japan and Hawaii, handling the teas and raw silk of the two former and the raw sugar of the latter.

It deals also with Australia and the Philippine Islands, while lines of steamers connect it with the Pacific ports of South America. It also ships large quantities of western produce by rail for Atlantic ports.

Seattle stands second among the Pacific ports, being admirably situated on the fine inlet of Puget Sound. It has lines of steamers to the chief ports of China and Japan and to the ports of Alaska and a large trade by rail reaching eastward to London and Liverpool. Tacoma is also a thriving port on the same inlet.

Lake Ports.—Chief among our lake ports stands Chicago, the second city in size of the country. In grain, lumber, and meat products it does the largest business of the world, and is the leading centre of the meat packing industry. Other large grain-shipping points are Milwaukee, Superior and Duluth, the last having also a large shipping-trade in iron ore. Ohio has an important lake port in the city of Cleveland, which deals largely in grain, coal and iron ore; and New York in the city of Buffalo, which is the point of transshipment between lake steamers and the Erie Canal. Detroit and Toledo are also thriving lake ports.

River Ports.—Among our inland river ports St. Louis stands first, it being the commercial centre of the Mississippi Valley and the distributing point for a large region to the south and southwest. Farther north on the Mississippi is the active railroad centre of St. Paul, while the Missouri has an important trading point in Kansas City, which ranks next to Chicago in meat-packing. Cincinnati, Louisville and Pittsburg are the trading centres on the Ohio; Cincinnati being notable for its manufacturing and pork-packing industries; Louisville as the greatest tobacco market of the world; and Pittsburg as a supreme point in the iron and steel manufacture.

CHAPTER XVIII.

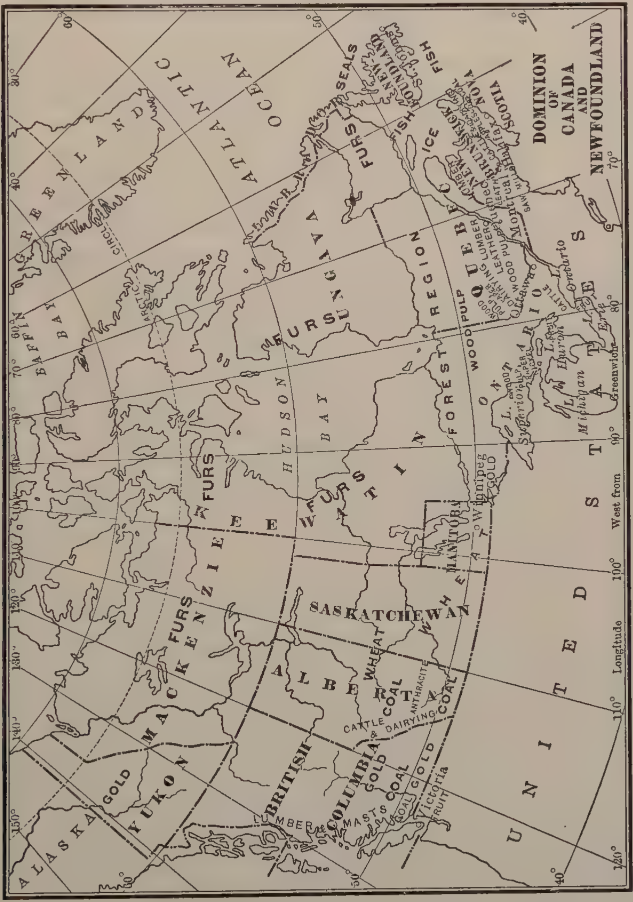
CANADA AND NEWFOUNDLAND.

Extent and Climate of Canada.—North of the United States, extending from the latitude of the Great Lakes to the Arctic Ocean, lies the Dominion of Canada, a colony of Great Britain, though so far as size is concerned the home-country would be lost in one of the provinces of its colony. The territory of Canada, in fact, is about as large as that of the United States, including Alaska, though its population is less than that of the State of Pennsylvania.

This smallness of population is due to climate. Lying in the colder regions of the north temperate zone and extending into the north frigid zone, much the greater part of Canada is a bleak and barren region, with no inhabitants except a few Indians and Eskimos, and a small number of fur-hunters and traders. In this vast northern section the hardiest grains can not be grown, and farming, which is the chief industry of the southern section, has no place

The People of Canada.—History tells us that Canada was originally settled by the French, and though Great Britain has held it for a century and a half, a large part of its people are of French descent. This is especially the case in the old provinces of Quebec and Ontario, the French keeping to their old habits and speaking their old language. In parts of the province of Quebec only French is spoken and in the streets of its capital city many of the policemen do not understand questions in English. Official notices are published in French. Thus, though two-thirds of the people of the Dominion are English, a traveller, in many sections, might think himself in old France.

Surface Conditions.—Canada consists of a broad central region of plains and prairies, with highlands east and west. In the east the Appalachian Mountain system of the United States extends into this country, sinking there into lower mountains and hills, interspersed with many fertile valleys. The western highlands comprise the north-



ern section of the great Rocky Mountain System, hundreds of miles in width and with many lofty peaks. This elevated region extends to the Pacific and is a valuable mining country, coal and gold, with other metals, being found.

Agriculture.—The cultivation of the soil is the great industry of Canada, about three-fourths of the people being farmers, and a large part of the southern section of the country is devoted to tillage. Though the winters here are long and cold, with deep snows, the summers are warm enough to ripen the crops, and the people are able to raise much more food than they need for themselves, a large part of the produce being exported.

The Garden of Canada.—Ontario and Quebec form the old farming region of the country. Once covered thickly with forest, this has been cut away over millions of acres, farms taking its place. The most fertile region is that of eastern Ontario, near the Great Lakes. Here cereals, fruits and live stock are raised in abundance, the country being so prolific that it is known as the "Garden of Canada." Among the choice fruits raised here apples stand first, Ontario and Nova Scotia being famous for this fruit. The apple orchards in Annapolis and King's counties, Nova Scotia, are a sight well worth seeing. They extend along the roadside in an unbroken line for fifty miles and are notable for the abundance and magnificence of their fruit. The apple supply of Great Britain comes largely from the orchards of these two provinces. Wheat and oats are also abundant crops.

Grazing and Dairying.—Throughout eastern Canada grazing and dairying are active industries, and live cattle and sheep, with meats and poultry, are shipped largely to England. Of the meat exports, bacon is much the larger part. As the climate is too severe for much corn to be grown, the hogs are often fattened on peas.

Dairying is an important industry, its chief products being butter and cheese. In fact, Canada is the largest cheese-exporting country of the world, nearly all its cheese going to Great Britain. The art of cold storage also enables much fresh butter to be exported. Thus, as may be seen, this small section of Canada takes its share in feeding the crowded population of Great Britain.

CATTLE RANCH, CANADA.

The Wheat Belt.—In the west is another large agricultural region, that of the great plains, a thousand miles in width, and embracing the provinces of Manitoba, Saskatchewan and Alberta. Here is the prolific wheat belt of Canada. Though but recently developed, it already vies with Minnesota and the Dakotas in the culture of spring wheat. Its yield is much larger than that of the Dakota fields, and it bids fair to become the greatest wheat-growing region of the world.

A prairie country, its deep, rich soil is underlaid by a layer of clay that keeps the water near the surface, while in the drier sections irrigation by the waters of the mountain streams is being introduced. We are here in a much higher latitude than that of the fields of Ontario and Quebec, but the climate is tempered by the warm Chinook winds from the Pacific, those winds which aid the farmers of Washington and Oregon. Since 1900 there has been a steady stream of emigration from the wheat fields of Minnesota and Dakota into this region, adding thousands of skilled farmers to the population of Canada. The wheat harvest of Canada is at present about one-fifth that of the United States, but it is very rapidly increasing.

Canadian Lumber.—A native product of Canada of very great value is its lumber. The belt of forest extends across the country for several thousand miles, from New Brunswick and Nova Scotia to Alaska. Fine timber covers the wide region of the Rocky Mountains and extends through British Columbia to the coast. While in the east much of the forest has been cleared off for farming purposes, what remains constitutes one of the largest lumbering areas in the world. The leading trees in the east consist of pine, spruce, fir, hemlock and tamarack, while the hard-woods include oak, walnut, hickory, chestnut and many others. In British Columbia the great Douglas-fir is the chief lumber tree, furnishing strong, tough wood for masts and house-building. Saw-mills are actively converting the forests into lumber, which finds a ready market in the United States, but in the broad northern woodlands, untouched as yet by the forester, are vast supplies of spruce, fitted to yield abundance of wood pulp for paper-making.

The Fur-Seekers.—For centuries past Canada has been a favorite resort for the fur-hunter. As early as 1670 the Hudson Bay Fur Company was formed by Prince Rupert and a stock company, to whom Charles II. granted a large section of Northern Canada. Within recent years this company transferred its lands to the Canadian Government, but it is still engaged in the fur business, Indians being employed in hunting the animals.

Throughout the chill northern section of Canada all the animals—the bear, otter, fox, beaver, marten, mink, etc.—are clad in thick, warm skins, or "pelts," for which there is a ceaseless demand at high prices. The once abundant supply of these animals has largely vanished from the lower latitudes, but in the barren and frozen lands of the far north they are still abundant.

STACKING WHEAT, PORTAGE LA PRAIRIE, CANADA.

Fisheries.—The fisheries of Canada have few rivals in richness of supply. The shallow waters along the Atlantic coast and the banks of Newfoundland are their chief fields; the cod, halibut, herring, mackerel and other food fishes abounding. The lobster is also very plentiful and finds a ready market. American and French fishing vessels frequent these waters, but are not permitted to fish within three miles of the shore, and within this limit the Canadian fishermen have a rich field, yielding them an annual income of about $20,000,000. Large part of the catch is exported, New Brunswick sending millions of young herring to Maine, where they are canned as sardines.

On the Pacific coast are large salmon fisheries, British Columbia supplying about one-fourth of the total fish harvest. The most extensive salmon canneries of Canada are those on the Frazer River. There are fisheries of some importance on the Great Lakes, where white fish, trout and sturgeon are taken.

Minerals.—The mountains of Canada contain valuable minerals, which are mined to a considerable extent. There are gold-mining regions in British Columbia, Ontario, and Nova Scotia, but much the richest section is that found in 1897 on the Yukon River in the north. Here gold has been obtained in abundance, the annual output of Canada at present being about $10,000,000. This is a decrease since 1900, when the find was twice that amount. Silver also has a large yield, reaching a value of about $11,000,000. Within recent years rich nickel deposits have been found in Ontario, and these now yield about half the nickel of the world. All the find of this metal goes to the United States.

Coal of excellent quality has long been mined in Nova Scotia, and British Columbia also has extensive beds, from which San Francisco obtains its supply. Iron ore occurs in many localities. Among other mineral products are copper, asbestos, petroleum, gypsum and phosphates.

Manufactures.—Canada has not yet had a large development in manufacturing industries, finding that it can supply itself more cheaply in most cases from the United States. The chief centre of manufacture is in Montreal, where there are large sugar refineries, iron-works, cotton and shoe factories, etc. Quebec has extensive tanneries, and Toronto is an active manufacturing city. Agricultural implements are made both for home-use and for export, and wood-pulp finds a ready market in the United States.

Means of Transportation.—The people of Canada have been specially active in improving their facilities for transportation, and have done remarkable work in this direction, in view of the fact that the total population of the country is less than that of some of our States and less than double that of the one city of New York.

Their enterprise has taken the form of canal- and railroad-building, and, all things considered, there is no more ambitious example of railroad work in the world than the 3000-mile Canadian Pacific, running from Montreal across the continent to Vancouver, on the Pacific coast, and crossing the Rocky Mountains in its course. A connecting line carries it to the ports of Halifax, New Brunswick, and with its supplementary lines it has a total length of nearly 10,000 miles. This line forms the most direct and shortest route for the trade of Europe with Asia.

BRANDING CATTLE ON A RANCH.

A second east and west route, the Grand Trunk, traverses in part the northern United States and in part the provinces of Quebec and Ontario. It is of interest from the fact that it is now being rapidly pushed westward to the Rocky Mountains, with the purpose of reaching the Pacific at a northern point. This and the Canadian Pacific cross the great wheat belt several hundred miles apart and are being connected by a net-work of north and south lines, which will give the wheat-raisers cheap and ready transportation to their distant markets.

Canadian Waterways.—Nature has provided Canada with a splendid waterway, that of the Great Lakes and the St. Lawrence River, affording navigation inland for more than 2400 miles. The breaks in this route made by Niagara Falls and the rapids of the St. Lawrence and the St. Mary's have been surmounted by canals. A canal lock at St. Mary's Falls connects Lake Superior with Lake Huron; the Welland Canal connects Lake Erie with Lake Ontario, past Niagara Falls; and a system of canals carries navigation past the St. Lawrence Rapids. Thus, by means of lakes, canals and rivers, vessels drawing fourteen feet can load at the inland Canadian ports and discharge at Liverpool. The one disadvantage is that the Atlantic ports are apt to be closed by ice during the winter season, so that then it becomes necessary to send freight to United States ports for shipment abroad.

Centres of Commerce.—Montreal, with a population of about 300,000, is the commercial centre of the Dominion. Situated on the St. Lawrence, with unobstructed navigation to the sea, lines of trans-Atlantic steamers reach it in the summer. It is also the principal terminus of the Canadian Pacific and Grand Trunk Railways, so that it has easy outlets for its large trade with Great Britain.

Toronto, with more than 200,000 population, comes next in size and importance. It is one of the chief lake ports and has active manufactures. Of Atlantic sea-ports Halifax is the chief. It has one of the best harbors on the

Atlantic coast. This is usually free from ice, making this town very active commercially, while it is the chief British naval station in America.

Quebec, the oldest French settlement in America, is chiefly interesting for its history and for the fact that it is still largely French in its population and customs. In the great interior, Winnipeg, the metropolis of Manitoba and the wheat region, is a city with a promising future. It has more than doubled its population within ten years and has now nearly 100,000 inhabitants. Reaching the Pacific coast, we find two ports, Vancouver and Victoria, important as the centres of trade with Asia and the United States Pacific ports.

Newfoundland.—This large island off the North Atlantic coast has so far kept separate from the Dominion of Canada. It has a government of its own, but is of no great industrial importance aside from its abundant fish crop. Here the cod and other food fishes abound and have been eagerly sought by fishermen since John Cabot proclaimed their vast numbers. Half the exports of the island consist of dried cod. The oil seal is also sought for its oil and skin. St. John's, the only town of any importance, has a fine harbor and is wholly engaged in the trade in fish and oil. Some farming is done, there is good timber on the hills, and there are minerals of value in the rocks, especially copper, nickel and lead.

CHAPTER XIX.

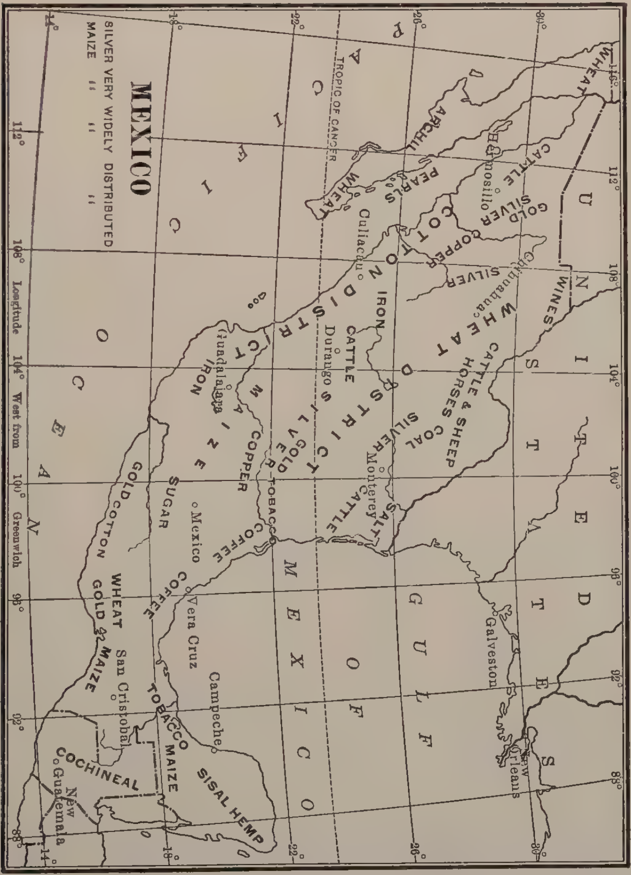
MEXICO, CENTRAL AMERICA, AND WEST INDIES.

Mexican and Central American Plateau.—If we seek the region of North America south of the United States, it is to find ourselves in a country largely composed of highlands. The Rocky Mountains here spread out into a long and wide plateau, rising from 4000 to 8000 feet high, with occasional volcanic peaks of nearly 20,000 feet elevation. In Mexico this plateau occupies the centre of the country, and is bordered by a low coast-plain, tropical in climate, on each side. In Central America the plateau becomes narrow and is situated near the Pacific coast, wide lowlands extending from it to the Atlantic.

Climate and Manufactures of Mexico.—Mexico is much the largest and most important of these countries. Its climate varies from the hot and moist zones adjoining the coast to a temperate and well watered belt of intermediate height, and a cool and dry zone in the higher uplands. Thus, while part of the country has a superabundance of rain, and another part an adequate supply, in the high plateau irrigation is necessary for successful farming.

Mining and farming are the principal occupations of the country, the manufactures being of small importance, though considerable progress has been made in cotton-weaving and there are also woollen mills, sugar refineries, and cigar factories. All the cotton raised in Mexico is worked in its own mills and some is imported from Texas.

Farming Products.—In the tropical lowlands the soil is largely devoted to coffee, sugar-cane, the rubber tree and tropical fruits. At a higher elevation grain and the fruits of the temperate zone are raised. Corn is the most important crop, Mexico being one of the chief corn-producing countries. The people largely live upon it, in connection with black beans, these forming the staple articles of food. Rice also yields a considerable crop.



Tobacco is another crop of importance, and is of excellent quality. Others of the products are, cacao, vanilla, oranges, and bananas, all of which find a market in the United States. A product of great importance is sisal-hemp or heniquen, a fibre obtained from certain species of the agave, or American aloe, and used for making sacking, cordage and binders' twine. Much of the soil of Yucatan is devoted to this plant and very large quantities of it are exported to the United States. The juice of another species of agave is used to make pulque, the national drink of the Mexicans.

Forest Products.—The forests yield lumber of importance, including such valuable woods as mahogany, rosewood, and ebony, also cedar, oak, walnut, etc. Logwood is sold largely to Great Britain, yielding dye for its textile mills. Yet the needs of the mines have robbed many of the mountains of their timber, and wood is largely imported into this country, chiefly from our Pacific States. In the north and on the high plateaus large numbers of cattle, donkeys and sheep are raised, many of them for export to the United States.

Gold and Silver.—Mexico has long been known as a large yielder of gold and silver, especially the latter, the total product of the mines footing up to more than $3,000,000,000. It is especially famous for its silver yield, this being the largest of any country in the world, and one-third greater than that of the United States, which ranks second. The methods of mining have long been primitive, but of recent years modern methods have been introduced by American and European miners and the product has been greatly increased.

Other metals include iron, copper, mercury, lead and tin, with good coal. Asphalt and petroleum have been found, but not much worked. Rock salt occurs in abundance. Mexican onyx is much prized as an ornamental building stone.

Railroad Enterprise.—Of late years there has been much railroad-building, largely instigated by American capital and enterprise. The roads connect with those of the United States at several points, so that it is easy to reach the city of Mexico from this country. Mexico narrows at the isthmus of Tehauntepec, in its lower section, to 130 miles in width and across this one of the most useful of its railroads has been built, affording easy communication between the Gulf of Mexico and the Pacific Ocean. It greatly shortens the distance between Atlantic and Pacific ports and a steamship line from New York to Honolulu makes use of this route. The trade between Mexico and this country is considerable, exports and imports each reaching a value of nearly $50,000,000 annually.

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Pineapple Plantation, Jamaica.

Centres of Commerce.—The city of Mexico, the capital of the country, is its centre of finance and commerce, while Vera Cruz is the chief port of the country, with steamship lines to New Orleans, New York and Europe. Acapulco, on the Pacific coast, has one of the finest ports in the world, but it has little trade from lack of railroad connections. The sisal-hemp is shipped chiefly from Progreso, in Yucatan, and Matamoros is a centre of the cattle-trade.

Central America.—The five Central American States of Guatemala, Nicaragua, Costa Rica, Honduras and Salvador, are of small size and minor importance, the whole of them, with Belize, or British Honduras, being no larger than New England and the Middle States. They resemble Mexico in climate and surface conditions, the highlands, on which most of the people live, being here near the Pacific coast, while the low country, extending to the Atlantic coast, is of tropical heat and drenched by an enormous rainfall. As a result it is a region of virgin forest, inhabited chiefly by wandering Indians.

Conditions of the States.—Of the Central American countries Guatemala is the most important and prosperous and has the largest commerce. British Honduras, on its Atlantic coast, has its chief value in the mahogany and logwood shipped from its forests. Honduras possesses mines of gold, silver, iron, copper and other minerals, and valuable forests, but is little developed; many cattle are raised. Nicaragua also lacks development. Here is a great spread of tropical forest, containing rubber, dyewoods and medicinal plants. The people live chiefly on the healthy uplands, which extend about one hundred miles from the Pacific coast.

Costa Rica, the most southerly of the States, is crossed by a railroad and is favorably situated for commerce, but little has been done in the way of developing its resources. Salvador, lying between Honduras and the Pacific, is the smallest independent country in America, but being wholly in the healthy highland region, it is the most densely populated of the Central American States. As in Mexico, Indian-corn is the chief food crop of the people of these countries.

Coffee.—The most important product of Central America is coffee. It is chiefly grown on large plantations, owned by wealthy planters, the people going out to pick the crop in December, when the berries ripen. The handling of them consists in washing, drying in the sun, hulling,—a process that needs expensive machines—and bagging for market. The berry is deep-red in color and rather smaller than a cherry. Inside are two seeds enveloped in a juicy pulp, which is removed by washing. Costa Rica coffee is highly esteemed for its superior flavor and much of the crop is bought by foreign agents months before the harvest season.

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BANANAS STACKED ALONG RAILROAD.

Other Products.—The other products of importance are mahogany, hides and fruits, large numbers of bananas being shipped to United States ports. Salvador has two products peculiar to itself, one being the balsam of Peru, of value in medicine; the other indigo, which was the largest export before the development of coffee-culture. The balsam of Peru is so called because it was formerly thought to be a Peruvian product.

Commerce.—The commerce of the Central States is of no great importance. About half of it is with the United States, while Great Britain receives most of the forest products. Greytown, Puerto Barrios and Puerto Limon are the principal Atlantic ports. Those of the Pacific are Punta Arenas and Amapala, the latter one of the best harbors on the whole Pacific coast. From Puerto Barrios, on the Atlantic, a railroad traverses Guatemala, via Guatemala City, the capital, to the port of San José, on the Pacific coast, its length being 269 miles. From the Pacific ports are shipped the products of the mines, which yield annually about $3,000,000 in gold and nearly $1,000,000 in silver.

THE WEST INDIES.—Of the numerous islands of the West Indies, Cuba and Hayti, the two largest, are independent, the remainder belonging to various countries of Europe, except Porto Rico, which is in the possession of the United States. They are all tropical in climate and productions, sugar, coffee, tobacco, and tropical fruits being their leading products.

CUBA.—Cuba, the largest island, is especially fertile, the rainfall being abundant and the soil yielding largely. Sugar is its principal product, the soil being so rich that a single planting will yield seven successive crops of the cane. Its yield surpasses that of any other cane-sugar country, reaching the high total of about 1,500,000 tons a year. The nearness of the United States, which is the largest cane-sugar market in the world, is of great advantage to the island planters.

Tobacco.—Another important product is tobacco. That grown in the Vuelta Abajo district of the western end of the island is looked upon as far the best in flavor of all tobaccos and commands a high price. It is commercially known as Havana tobacco, though practically all the tobacco of the island is given this name, and also tobaccos from Porto Rico and elsewhere which are sent there and reshipped as the Cuban product. The island crop is a small one and great part of it is shipped in the form of leaf or cigars to the United States, much of it being made into cigars at Key West and Tampa. The manufactures of the island are almost confined to the making of cigars and other tobacco products.

Other Products.—Cuba has a large mountain area and valuable forests, containing mahogany, ebony, ironwood, dyewood, cedar and pine. Tropical fruits grow in great abundance and variety, while the hill-country yields various minerals, iron ore of valuable quality being mined and shipped to the United States for steel-making purposes. Copper is also mined. Railroads traverse the island from end to end, with branches to the several ports. Havana, the capital, is the principal port, though harbors are numerous and Santiago, Matanzas and Cienfuegos have considerable trade. The United States is the principal customer of the island, buying nearly $100,000,000 worth

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Loading Cars with Asphalt at Pitch Lake, Trinidad.

of its products yearly and sending it half that value in flour, rice, coal, textiles, kerosene and other materials. Cuba raises little food-products other than fruits and sugar.

Other Islands.—The island of Hayti contains two negro republics, Hayti and San Domingo. Civilization and industry there are at a low ebb and political convulsions are not infrequent. Coffee is the chief product of Hayti, and there are considerable exports of logwood and cocoa. From San Domingo sugar, tobacco and cocoa are exported, principally to the United States, and this country supplies more than half the imports of the island.

Jamaica, Barbados, and the Bahamas are the most important of the British colonies. The forests of Jamaica contain many valuable trees, and tropical fruits are grown in great variety, the principal trade being with England and the United States, to which many bananas are sent. Sugar is the chief commercial product of Barbados, and the Bahamas are valued as a winter resort, from their mild and pleasant climate. They yield little of importance besides sponges, sisal-hemp, and fruit. The Bermudas, a group of British islands lying farther north, are of value to the United States for their large shipments of onions and early potatoes, also of lily-buds, which are sent to New York and grown in hot-houses for the Easter trade.

With the remaining islands we may deal briefly. France holds a number of them, including Martinique, the scene of the Mont Pelee volcanic eruption. Denmark possesses several small islands. The chief product of all these consists of tropical fruits. Trinidad, one of the British islands, has a valuable resource in its remarkable lake of asphalt, which supplies large quantities of this material for street-paving, roofing and other purposes in our cities. About 100,000 tons of it are shipped yearly to this country. Of the West India cities, Kingston, the sea-port of Jamaica, comes next to Havana in importance.

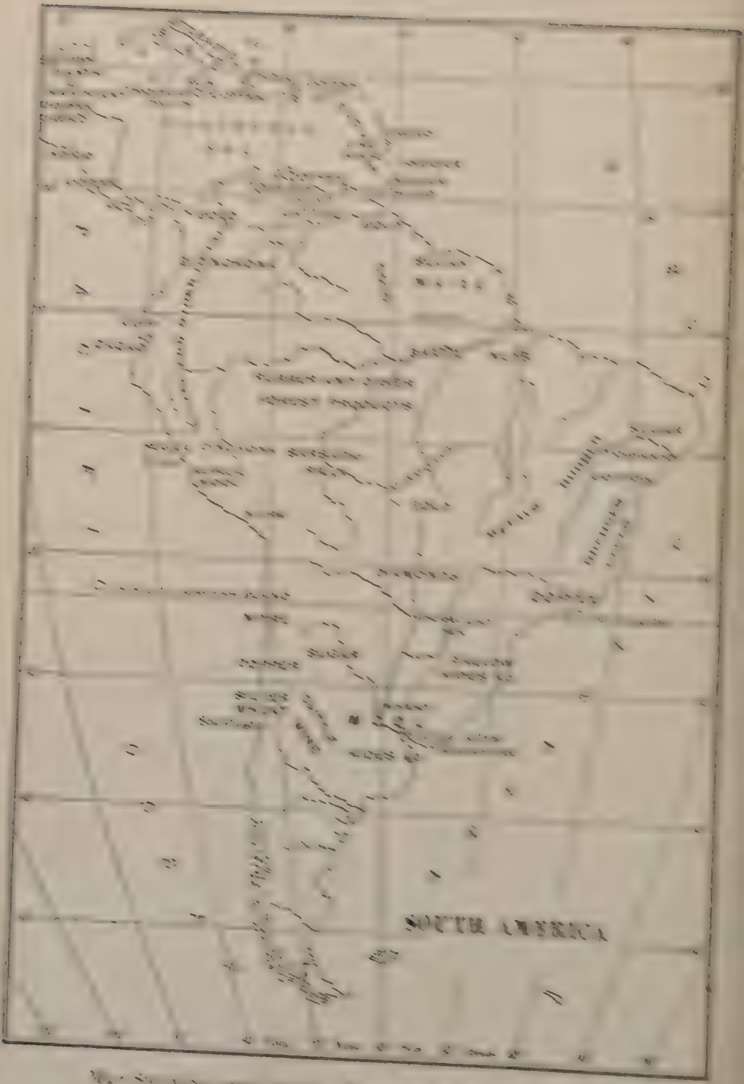
CHAPTER XX

THE HIGHLAND STATES OF SOUTH AMERICA

South and North America Compared.—South America in one respect bears a resemblance to North America. This is that it has a range of lofty mountains on the west, east of which lies a broad central plain, and on the Atlantic side a series of low mountain ranges. It differs from North America in the fact that much the greater part of it lies in the torrid zone, only its narrow lower portion being in the south temperate zone. But many of its States have their largest sections in the upland region of the Andes Mountains and thus have a temperate climate. It is these Andean States with which we shall first deal.

PANAMA.—The isthmus of Panama, the long and narrow strip of land which connects North and South America, is a tropical mountain country, with low marsh lands between the mountains and the Caribbean Sea. It runs east and west instead of north and south, and by consulting a map of America it may be seen that South America extends much farther towards the east and less towards the west than North America. Valparaiso, the chief Pacific port of the former, is farther east than New York, the chief Atlantic port of the latter, while the most westerly part of the continent is east of Cincinnati.

Industrially, Panama is of no importance. It is destined, however, to have large commercial importance when the great ship canal, now being excavated, is finished and much of the ocean trade of the world takes this route from the Atlantic to the Pacific. When this is done the cities of Panama and Colon, at the two ends of the canal, are sure to become bustling sea-ports.


SOUTH AMERICA

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Colombia.—Panama was formerly one of the States of the Republic of Colombia, which occupies the northwest section of South America. It is a large country, larger than Texas and California combined, but has a small population and little industrial importance. Like Mexico, it has three zones of climate, a tropical one near the sea, a temperate one at the mid-level, and a cool one in the higher mountain region. Westward it fronts on the Pacific Ocean and northward on the Caribbean Sea, but its transportation facilities are so poor that it has little trade on either of these bodies of water. Yet the treeless lowlands on the east are fine grazing regions and cattle and sheep are raised in large numbers. Their hides, horns and tallow are exported to the United States.

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Cacao Tree and Fruit, the source of Cocoa and Chocolate.

In the valleys between the mountain ranges wheat is grown and sheep are raised. Other products are coffee, sugar-cane, cacao and tobacco, which grow well in the country near the Caribbean coast and are raised for export, coffee being the chief product. Copaiba, and tolu balsam, rubber, and vegetable ivory are gathered in the forests by the Indians and form articles of export. The mountains yield gold and silver, the yield of gold being the largest of any country in South America. There are also valuable salt mines near Bogota, the capital, and near this are the famous emerald mines, which have yielded the finest known specimens of this precious stone.

Little can be said about the industries and commerce of Colombia. Its crude manufactures are for home use, and its commercial products are transported on pack-mules over wretched mountain trails. There are a few short railroads and several hundred miles of water transportation on the Magdalena and Orinoco Rivers, but transportation in general is very poor.

ECUADOR.—Adjoining Colombia on the south lies the small republic of Ecuador, a region rather smaller than New Mexico in size and inhabited mostly by Indians. Its commercial importance is slight, its most valuable product being cacao, the source of cocoa and chocolate. One-fifth of all the cocoa of the world comes from here. Other exports are coffee and sugar, while the forests yield vegetable ivory and rubber. Most of these products are carried by mule trains. Quito, the capital, lies at a high mountain elevation, and nearly on the equator. A carriage road connects it with Guayaquil, the principal sea-port and largest city.

Ecuador imports most of its bread stuffs and textile goods and its most important article of manufacture is the Panama hat. These hats are made by Indians from torquilla, the mid-rib of the screw-pine leaf. The straws are divided into the necessary widths by aid of the thumb-nail. They are carefully plaited, the work being done mostly at night, since the straw can be properly handled only when the air is moist. Panama hats bring from twenty-five to fifty dollars each in the American market, though most of those worn as Panama hats are imitations which are sold at a much lower price.

PERU.—Peru is a much larger country than Ecuador, having an area of nearly 700,000 square miles, and has large agricultural and mineral resources. It is situated almost wholly in the Andes, the mountains here coming near the sea, while the long strip of lowlands on the Pacific is a rainless desert. The elevation of the inhabited country gives it the cool climate of the temperate zone, and fits it for the cultivation of cotton and tobacco. Cotton is largely grown and yields a long-staple product of excellent quality. The best of it is used to make thread and the web of pneumatic tires. In the warmer valleys much cane-sugar is produced and coffee-growing is becoming active. In the mountain regions the principal crops are corn, wheat and potatoes. An interesting product is coca. The leaves of this plant for centuries have been used by the Indians as a stimulant. By chewing them a native porter can sustain his strength and carry a heavy load for many miles without food or rest. From the plant is obtained the substance called cocaine, now much used as a local anesthetic in diseases of the eye and throat and in dental operations.

A native plant of high value is cinchona. This yields the well-known Peruvian bark, long used as a remedy in malarial fevers. The medical substance quinine is extracted from this bark, and so great is the demand for it that the tree is now cultivated in several other countries. The forests of the Amazon River, which rises in eastern Peru, yield this plant, as also large quantities of rubber. Vegetable ivory is also gathered. This is the nut of a species of palm, so hard and white that it is used as a substitute for ivory.

Peruvian Animals.—The native animals of Peru include three species of the camel tribe, the llama, alpaca and vicuña. The wool or hair of these animals is used in making the cloth known as alpaca, and is largely exported to England for this purpose. Of these animals, the llama has long been tamed, and on its back much of the product of the mines is sent to the sea-ports. Cattle also are raised and hides exported.

Mining Products.—Peru has long been famous for its silver. It is now far surpassed by the North American countries, its annual yield having sunk to about $5,000,000.

A Pack Llama Train.

Those who have read the story of the ransom of the Incas will gain an idea of the large quantities of gold and silver mined by the Indians in past times. Other minerals yielded by the mines of Peru are copper, lead, zinc, mercury, coal, salt, borax and petroleum.

Manufactures and Commerce.—Little can be said of the Peruvian manufactures. They are of small importance and most of the goods needed are imported. Straw hats, sugar, candles, soap and a few other articles are made, while the articles imported include cotton goods, machinery, steel wares, kerosene, etc. Transportation, as in the other countries named, is poor, though about 1000 miles of railway are in operation. The Amazon and its tributaries make good water routes for the eastern section of the country. There is a railway between Lima, the capital, and Callao, the principal seaport, and from the latter are steamship lines leading to San Francisco and to British ports.

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TAPPING A RUBBER TREE.

BOLIVIA.—The area of Bolivia is somewhat larger than that of Peru, though, aside from its mining products, it is of much less importance. A war with Chile ended in the loss of all its Pacific coast territory and it is now wholly inland. Also its farming region is so remote from the mines that the miners have to depend on Argentina for their food. The forest of the Amazon is rich in rubber trees and much of this valuable substance is produced. Peruvian bark and vegetable ivory are also exported. Of cultivated plants, coffee, cacao and coca are the most important. Large numbers of cattle, sheep and llamas are raised.

The most valuable resources of Bolivia are its mines. These yield largely in silver, and also produce gold, tin, copper and some other products. They are not developed as they might be, since there are very poor means of transportation. Mules and llamas carry the ores and metals over difficult mountain trails to the railways, and the latter charge very high rates of freight, so that only goods of high value can be profitably shipped. The imports are mostly clothing, textiles, hardware and food-stuffs.

CHILE.—The last of the Andean countries to be spoken of is Chile, a remarkably long and narrow region which extends from the border of Peru to Cape Horn, a distance of nearly three thousand miles. Its width varies from forty to two hundred miles. Through nearly all its length the Andes extend in two parallel lines, having between them a central valley or tableland. The coast-land desert of Peru extends into northern Chile, but this desert region fortunately has a very valuable product in its extensive deposits of nitrate of soda, or Chile saltpetre, which is in large demand as a fertilizer. Nearly all of it is sent to Great Britain, France and Germany. Of the other mine products copper comes next in value. Some coal is produced, but of inferior quality; silver and lead are also found.

The people of Chile are notable for enterprise and activity, and though their country has but a small proportion of fertile soil, this is so well cultivated as to yield excellent results. The farming land lies in the middle section of the country, and is confined to the flood plains of the short rivers, a mile or two in width, there being long reaches of infertile lands between the rivers. These plains are densely peopled and the soil worked to its utmost, wheat, barley, fruit and other crops being grown in sufficient quantities not only for home consumption, but for export to the northern republics. Irrigation is necessary on much of the cultivated land and this is conducted with admirable skill and rich results. On the uplands cattle and sheep are raised in large numbers, yielding wool, hides and leather for export. In the southern section of the country the rainfall is large and the forest growth heavy. Here lumbering is an active industry. Fishing is also actively pursued.

Chilian Railroad Enterprise.—Commercially the Chilians are energetic and have equipped their country well with railroads, partly built and operated by the Government.

Native Chilian Carts.

The most important of these extends along the valley between the mountain ranges, starting south of Concepcion and extending northward to Santiago, the capital, whence it crosses the coast range to Valparaiso, the principal seaport. A branch of this road has been carried across the Andes, reaching an elevation of nearly 10,000 feet and passing through a tunnel more than six miles long. Thence it is carried to Buenos Ayres. Its total length is 880 miles, and it forms an important route between the Atlantic and Pacific, far north of the Straits of Magellan.

Commerce.—Valparaiso is the largest sea-port and the chief business and financial centre on the Pacific coast of South America. The trans-andean railroad from Buenos Ayres adds greatly to its importance. The foreign trade of the country is now largely controlled by Great Britain, Germany and France having a minor part of it. The imports are mainly coal, iron, machinery, textiles and sugar. Of these the United States has some of the textile trade, and also sends coal oil and pine lumber from Oregon and Washington. Manufactures are more developed than in any other South American country, the industries including iron mills, locomotive, boiler and car works, flour mills, sugar refineries, tanneries, breweries, etc. In fact of all the Andean states of South America, Chile is the most enterprising and progressive, being much in advance of the other nations on this side of the continent.

CHAPTER XXI.

THE LOWLAND STATES OF SOUTH AMERICA.

The Lowland Plain.—The Andean States of South America occupy but a small part of the great territory of that continent, there being a far greater body of land east of the Andes. This constitutes a vast lowland plain, broken near the Atlantic coast by some low mountain ranges, but elsewhere a wide level. It is made up of the great republic of Brazil, occupying nearly half the continent; of two countries of considerable extent, Venezuela and Argentina; and of several small divisions. Of the Andean States only two, Colombia and Bolivia, extend far into this lowland region.

VENEZUELA.—The farthest north of these lowland States is Venezuela, a country of varied surface. It has low and hot levels near the coast; south of these a mountain region, high and healthful; still farther south, great grassy plains, known as llanos, the grazing grounds of millions of cattle. Through this country flows the broad Orinoco, from which the llanos spread northward, while south of the river valley are highlands covered with dense forests. In these hills gold is found and mining goes on. Most of the people avoid the tropical lowlands and live in the mountain region, the valleys of which are the farming districts of the State.

Products.—Coffee is the great crop of the hill country and is the staple article of export, the United States and Europe taking nearly all the yield. Cacao, a lowland crop, comes next in importance to coffee, and the sugar-cane is cultivated, the Government protecting the planters in this industry by forbidding the importation of sugar into the country. Some grain is grown in the mountains, but much wheat flour is imported. Other crops are beans and potatoes. On the llanos cattle, horses, sheep, swine and goats find abundant pasturage, but the cattle are of inferior breeds and their hides and beef are alike of low grade.

Forest and Mineral Yield.—Of the forest products the most important are rubber; fustic, which yields a yellow dye; divi-divi, a plant rich in tannin; and the tonka bean, which is used as a perfume. There are rich mineral deposits, but they are little worked. The gold yield, once promising, has become very small; there are copper and salt mines, coal and iron are abundant, and there are rich springs of petroleum. Among the important products is asphaltum, of which large deposits are found near the coast, similar

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SMOKING RUBBER, BRAZIL.

to that of the British Island of Trinidad, a short distance from the coast. This substance is extensively exported and much of it used for street-paving.

Commerce.—Venezuela has poor means of transportation, except that in boats on the Orinoco River, and its commerce is small. The manufactures also are of little importance, cheap hats and shoes, straw goods, etc., being made for home use. Nearly all the manufactured goods needed are imported, the United States furnishing the greatest amount. Caracas is the capital and largest city, and there are several sea-ports, of which La Guaira and Puerto Cabello are the most important.

GUIANA.—South America has the fortune to be free from European control, with the exception of the minor region of Guiana, which adjoins Venezuela on the east and is divided into the three small colonies of British, Dutch and French Guiana. It resembles Venezuela in surface and climate, its most important crop being sugar. But the competition of beet-sugar has proved ruinous to many of the planters, and coffee, cacao, cotton, tobacco and rice are now being grown. The commerce is unimportant and the most valuable product is gold, the annual yield of which in British and French Guiana is about $3,500,000.

BRAZIL.—Largest and most populous among the South American countries is what now bears the title of the United States of Brazil. Originally a Portuguese colony, then an American empire, it is now a federal republic like our own. In geographical extent it is somewhat larger than the United States, excluding Alaska, though far below it in political and industrial importance. Occupying the great basin of the Amazon River and its tributaries, and that of the upper waters of the Platte River tributaries, it extends in length over nearly forty degrees of latitude and in width over as many of longitude, occupying a large part of the American tropics.

Much of this great territory is unfitted for the production of food-plants. This is especially the case with the Amazon basin, which is occupied by the most extensive and dense tropical forest in the world and is in great part a wilderness with no inhabitants but wandering Indians.

The Amazon River is navigable for twenty-two hundred miles from the sea and it has large navigable tributaries, but there are no settlements back from the line of the streams. Chief among the Amazon towns is Manáos, far inland from the coast, but reached by ocean steamers.

The forest of the Amazon has considerable commercial value in its large yield of rubber, which is about half of that of the world. A considerable part of this rubber comes from the neighboring Andean States in which rise the Amazon and its upper tributaries, but the output is from Brazilian ports. The forest contains other valuable trees, but little lumbering is done.

Brazilian Coffee.—Brazil has another crop in which it far surpasses all other countries, that of coffee, the annual yield of which is estimated at 1,600,000,000 pounds, while the rest of the world yields less than half this amount. Coffee is grown in the higher lands along nearly all the coast, as far north as the Amazon, though the southern State of São Paulo yields about 1,000,000,000 pounds and the adjoining state of Rio de Janeiro nearly all the remainder. These states are specially adapted in soil to coffee culture, and have also the dry weather in harvest-time needed for the drying of the crop.

Harvesting goes on from May till September, as the berries ripen. These are gathered when ready to fall by spreading cloths on the ground and shaking the trees. They are then dried on mats in the open air, pressed between rollers to get rid of the husk, and the seeds again dried in the sun, winnowed, sorted into grades, and packed in sacks of 132 pounds each. Of this great coffee-crop about half comes to the United States, the greatest of coffee-drinking nations.

Other Vegetable Products.—Chief among the other crops are cotton and sugar-cane, the raw sugar being sent to the United States and England to be refined. Cotton is also an article of commerce, though much of the yield is woven into cloth in Brazilian mills. The most important food products are rice, black beans and manioc. This is a plant having a great tuberous root, which yields farina, much used in South America as a food, and also tapioca. Other crops include yams, sweet potatoes, maize, and tropical fruits. An important product is the Brazil nut, the fruit of a tree that grows wild in the forest, and bears large spherical pods, each containing about twenty-four of the hard, triangular nuts so well known in our markets, large numbers of them being shipped to the United States and Europe. Vanilla, well known as a flavoring substance, is another forest product.

Wheat is grown in the south, and cattle and swine are raised, but it is necessary to import much food, for the Brazilian planters find that coffee, cotton and sugar pay better than food-plants. The cattle are kept for home use, but hides and tallow are among the exports.

Minerals and Manufactures.—Gold and silver are mined, the latter in much the larger quantity, and much manganese ore is exported; but iron, copper and coal, though they occur in paying quantities, have not yet been worked. Brazil has the distinction of being one of the few diamond-yielding countries, and before the South African diamond mines were discovered, it was the richest producer of this gem in the world. The diamonds are found in the sands and gravels of river beds, in company with alluvial gold. The largest stone, the Star of the South, found in 1853, weighed 254½ carats in its crude state and 125 carats when cut. It was sold to a Hindoo Prince for $400,000.

Manufactures are as yet of little importance, though German immigrants are founding new industries.

Transportation and Commerce.—The transportation facilities of Brazil, aside from those of the rivers, are poor, the railways being mainly short lines from the plantations to the coast. Rio de Janeiro, the capital and commercial centre, is the largest coffee market in the world, and is the second city in size on the continent, having a population of 811,000. Para, Bahia and Pernambuco are other important sea-ports.

The foreign trade of Brazil amounts in value to about $300,000,000, cotton and woollen fabrics, steel and machinery, preserved fish and meats being imported, while forest and plantation products constitute the exports. The value of the exports to the United States, nearly all coffee and rubber, amounts to about $100,000,000 yearly, while the imports from this country, consisting of flour, coal oil, hardware, iron and steel goods, etc., are valued at less than $20,000,000.

ARGENTINA.—The two republics of Argentina and Chile occupy nearly the whole of the south temperate zone in South America, and of these Argentina, with an area of 1,135,840 square miles, is nearly four times the larger. It extends from the southern border of Bolivia to Cape Horn, and from the Andes to the Atlantic, embracing in its southern section the old region of Patagonia, once well-known, but no longer on the map. With the exception of Chile, its neighbor, Argentina is the most enterprising country of South America, and is progressing at a rapid rate. Emigrants from all parts of Europe form part of its population and have given great vitality to its industries.

Argentine Products.—The leading products of this country are cattle and wheat. The country, from the Atlantic to the Andes, is a vast prairie region, covered with nutritious grasses and feeding immense herds of cattle and sheep. These wide, treeless plains, or pampas as they are called, yield food for over 20,000,000 cattle and 75,000,000 sheep. As a result, Argentina has become one of the great wool-producing countries, its yield being about equal to that of the United States. Nearly the whole of this is exported to manufacturing countries.

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RAMBOUILLET RAM, ARGENTINA.

In former times the sheep and cattle were mainly of use for their wool and hides, though large quantities of beef extract were made and exported. By means of the new developments in the art of refrigeration the formerly wasted meat is saved, being exported in a frozen state. Great quantities of jerked or sun-dried beef are prepared and many cattle sent to Europe alive in deck pens. The heat of the tropics forbids their transport below deck. The cattle and sheep, formerly of low grade, are being rapidly improved by the importation of high-grade animals.

The great agricultural product is wheat, in the growth of which remarkable progress is being made. The annual yield has increased within a few years from about 100,000,000 to 200,000,000 bushels, few countries now surpassing in quantity the Argentine crop, while the wheat exports promise in the near future to surpass those of any other country. The wheat area is rapidly invading the pampas and aiding to supply the great demand of the modern world. Flax comes next to wheat as a farm product and much corn is grown. The warmer sections yield also coffee, sugar-cane and tobacco.

Minerals and Manufactures.—Gold, silver and copper occur in good quantities, though they have as yet been little developed. Iron, sulphur, borax, petroleum and nitrates are found, while extensive forests, rich in valuable timber, cover the lower portions of the mountains. As regards manufactures, there has as yet been little development, this mainly consisting in flour-making and the production of wine, beer and distilled liquors. Hats, paper, and leather goods are made, and coarse cotton and woollen cloths woven.

Transportation.—The Plate River and its tributaries offer an easy route to the ocean and railways are being actively developed, there being now over 12,000 miles of line, including the remarkable trans-andean road to Valparaiso. Electric railways are also making active progress, the people being very enterprising in this particular.

Commerce.—The exports of Argentina consist wholly of products of field and farm, and the imports of such necessary articles as clothing, boots, shoes, textiles, agricultural implements, iron and steel goods, oils, etc. Buenos Ayres, with more than 1,000,000 population, is the great port and metropolis of the nation. Below the capital is the sea-port of La Plata, and on the Parana is the river port of Rosario. This is a railway centre, as is also the inland city of Cordoba.

URUGUAY.—Uruguay, separated from Argentina by the Uruguay branch of the Plate River, is a small State with a large foreign population, chiefly engaged in stock-raising. Much attention has been paid to the introduction of improved stock, and this little country is becoming prominent among the cattle and sheep exporters. Here is made the famous Liebig extract of beef. Wheat is the most important cereal crop. Montevideo is the capital and sea-port city.

PARAGUAY. — Paraguay is a small State lying wholly inland and with no communication with the sea except by way of the Parana River and its tributary, the Paraguay. It has a large forest area, but this is of no value from lack of means of transportation, Argentina finding it cheaper to import lumber from Australia than to get it from this neighboring State, or from its own forests. Cereals are raised for home consumption, the only exports being small quantities of sugar, hides, tobacco and maté, or Paraguay tea. This being cheaper than ordinary tea, is largely used as a beverage in South America.

THE MATÉ OR SOUTH AMERICAN TEA PLANT.

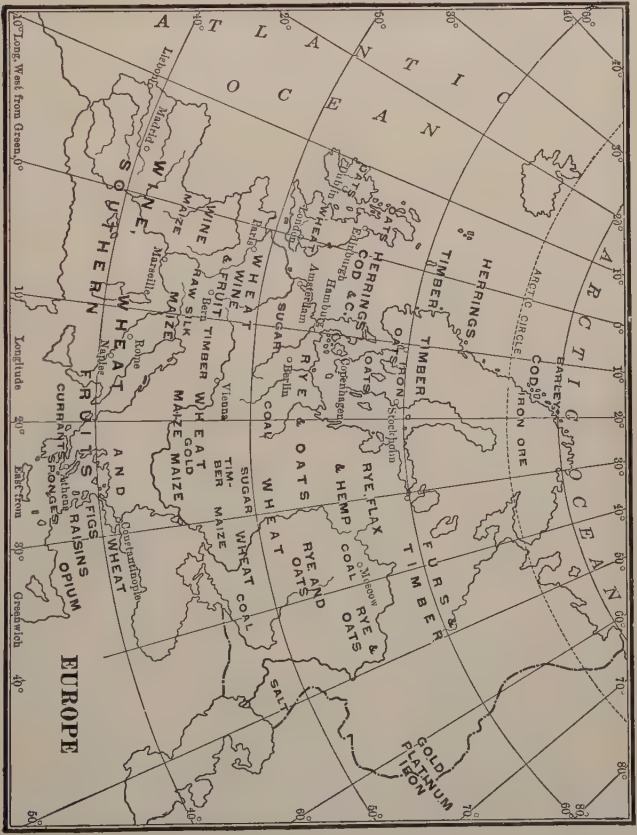
CHAPTER XXII.

THE BRITISH ISLES AND THE GERMAN EMPIRE.

The United Kingdom.—Off the west coast of Europe, only a few miles removed from France in their nearest part, lie the British Isles, politically known as the United Kingdom of Great Britain and Ireland. Though these islands are of high importance in the world of commerce and industry, and have had a remarkable history, they are comparatively small in size. Great Britain, composed of the former kingdoms of England, Scotland and Wales, is little larger than the State of Minnesota in size, and Ireland little larger than South Carolina. Yet their population is nearly half that of the whole United States and their industrial and commercial standing superior to that of any other country in the world. Their nearest rivals are Germany and the United States.

The British Empire.—Small as is the area of the British Isles, the region of the earth controlled by them is immense in size. They possess colonies in all continents and all seas:—America furnishing the immense domain of Canada; Asia, that of India, with its vast population; Africa, those of South and East Africa, and Europe, Gibraltar and the small island of Malta. There are also the continental island of Australia and various smaller possessions in the continents and oceans, the total area of what is usually called the British Empire being over 11,000,000 square miles and its population nearly 400,000,000. Thus controlling more than one-fifth the land area of the globe and one-fourth the population, the United Kingdom is of leading importance among the countries of the world.

Causes of Great Britain's Prosperity.—Defended by a powerful fleet, for eight hundred years this kingdom has defied invasion by the warring nations of Europe, and



MAP SHOWING THE PRINCIPAL PRODUCTS OF EUROPE

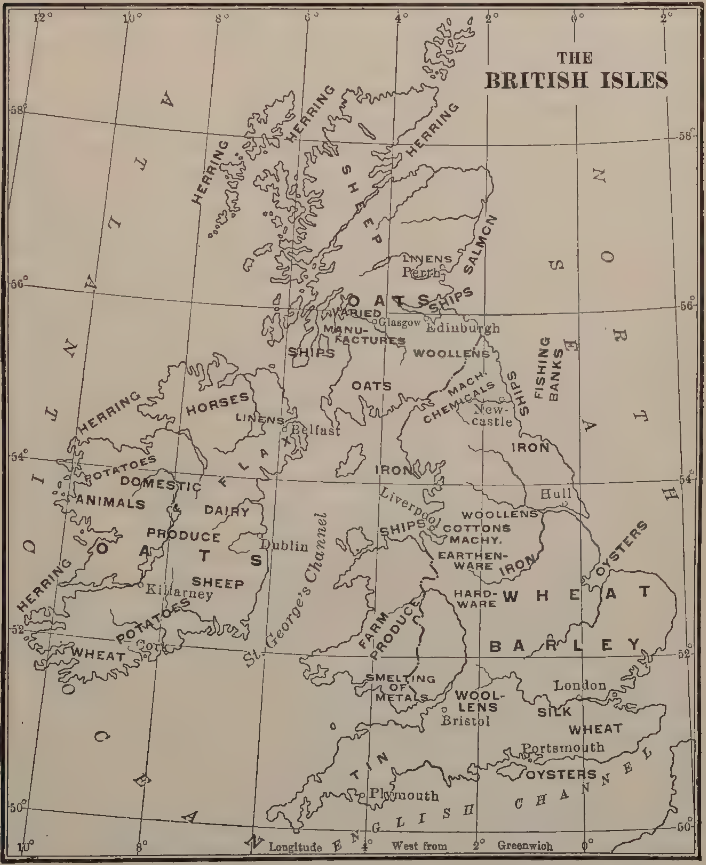
by its activity on the sea has taken possession of large regions in all parts of the world and thus founded the great colonial empire spoken of. This it largely supplies with the products of its looms and workshops, while drawing from its colonies much of the raw material needed in its busy factories. To this colonial trade Great Britain owes in great part its prosperity.

It is situated in a high northern latitude, the same as that of the barren country of Labrador. But the icy climate of the latter is replaced here by mild winters, while its northerly situation makes its summer days very long and brings abundant sunshine to its growing crops. Its mildness is due to the prevailing westerly winds, which bring to its shores the warmth of the Gulf Stream waters over which they have blown and also abundant moisture for its fields.

Field Products.—Much of the surface of the British Isles is too hilly to be profitably cultivated and some of the plains are too sterile to be farmed, but there is much fertile soil, and through close and careful tillage the farm lands of England are made to yield twice as much per acre as those of the United States. Yet their crops fall far short of the needs of the people and large quantities of foodstuffs are imported from foreign countries.

The highlands and the plains, unfitted for agriculture, show the effect of the damp winds in rich grasses and form excellent feeding grounds for cattle and sheep, which are kept in large numbers. The Scottish mountains yield food for great flocks of sheep, and there are over 30,000,000 of these animals in the islands. Grass grows luxuriantly in Ireland and about four-fifths of the farm land is in pasture, sheep, cattle and horses being kept in large numbers.

Improved Stock.—Careful feeding, continued for many years, has improved the British farm animals until they have become the finest breeds in the world, and Durham, Alderney, Jersey and other stocks of cattle have been largely exported to the United States and Canada for breeding purposes. They are also being exported to Argentina, Uruguay, and some other countries for the same purpose. The cattle of the north of England are bred especially for beef, those of the south and the Channel



Islands for milk and butter, while fine wool and good mutton are sought in the different improved breeds of sheep.

Food Imports.—The fact that very many of the population are concentrated within the cities and engaged in manufacturing and mining pursuits renders it necessary to purchase abroad the greater part of the food needed to feed them, the soil not producing one-fourth of that required. No other country buys so large food-supplies from foreign lands, wheat and flour in particular, which are obtained from the United States, Canada, Russia, India, Argentina and Australia. Much corn for cattle food and meat for human food are also bought in this country and many millions of dollars worth of frozen beef and mutton are sent to England from South America, Australia and New Zealand, the latter countries also supplying vast numbers of frozen rabbits. Europe supplies poultry, eggs and butter in large quantities, so that the whole world is put under contribution to furnish the busy workers of the British Isles with food.

The Fishing Industry.—The only kind of food which Great Britain produces in sufficient quantity is fish. All around the shores of the islands food-fish swarm and more than 100,000 men are kept employed in catching them. They include cod, flounder, haddock, and other fish, especially herring, which are caught in great numbers and form the only kind of food of which the British have an extra supply for export.

Coal and Iron.—The great prosperity of Great Britain is very largely due to the abundance of coal and iron found beneath its surface. To these it owes its long continued manufacturing supremacy. Coal is found in many localities from the south of Scotland to the Bristol Channel and southern Wales, and has been mined in such quantities that the supply has been greatly reduced. Its yield at present is much less than that of the United States, but is not greatly surpassed by that of all other countries combined.

Iron ore also occurs in fair abundance near the coal fields, but the quality needed for the best Bessemer steel is found only near Manchester and Birmingham, and pig-iron needs to be imported for steel making. This is unloaded chiefly at the ports of South Wales, so that this is growing to be the leading region of Bessemer-steel manufacture. Other metals mined are tin and copper, but large quantities of both of these are brought from distant lands.

At the Spinning-wheel, Ireland.

Manufactures.—The abundance of iron and coal long gave Great Britain the supremacy in all kinds of iron and steel goods. Only of late years have other countries entered the field as rivals. The centre of the larger iron industry is the city of Birmingham, while small articles like cutlery and tools have long centred at Sheffield. The great yards for ship-building are at Glasgow, in southern Scotland, and Belfast, in northern Ireland.

The other large field of British industry is the manufacture of cotton and woollen goods, of which England produces more than any other country. The invention of spinning and weaving machinery in the eighteenth century gave that country an early start in the making of textile fabrics, which the moist atmosphere of England favored, and to-day her cloth factories give employment to more than 5,000,000 operatives. Manchester is the leading city in the world in cotton weaving and Leeds in that of wool. Linen is also largely woven, the finest goods being made at Belfast and other places in northern Ireland, where much flax is grown. While the iron and textile goods mentioned are the leading British manufactures, a wide variety of other goods are produced, and the whole country teems with industry.

The Import Trade.—The raw materials of British manufacture need in great part to be brought from foreign lands, especially those for the textile industries. While a considerable part of the wool and flax needed are produced in the islands, all the cotton has to be imported. Textile fibres are obtained from all parts of the world, cotton in great part from the United States, wool from Australia, Argentina and other sheep-raising lands, flax from Russia, Belgium and other European countries, and, as has been said, food for the workman from all regions of the world.

As little timber is available at home, practically all the lumber needed for every purpose has to be brought from abroad, building-wood being obtained from the United States and the northern countries of Europe and ornamental woods from the forests of Honduras and other tropical countries.

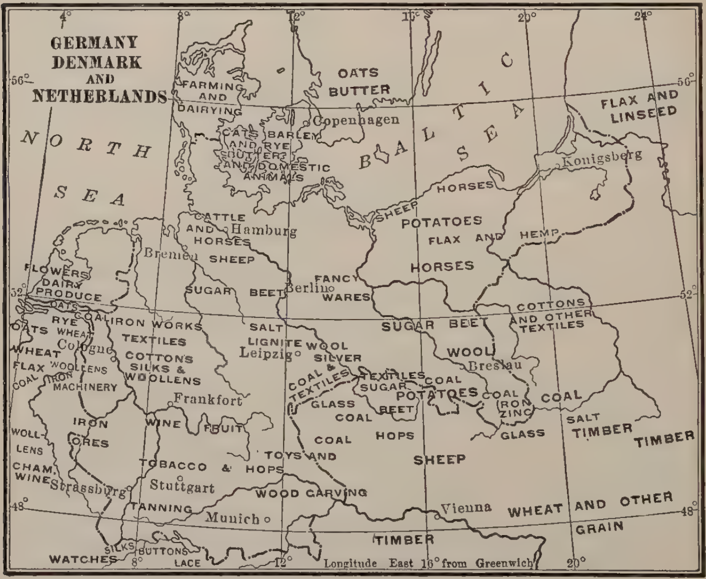
Exports.—The British exports consist mainly of manufactured goods, the only products of nature exported being coal and salted herrings. The cotton and woollen fabrics of the kingdom go everywhere, and the same may be said of the hardware and cutlery, with such small goods as pens, needles, pins and a great variety of other articles. The value of the imports approaches $3,000,000,000 and of the exports $2,000,000,000 annually, being much greater as a total than those of any other nation.

Transportation.—For the handling of its vast sum of goods the United Kingdom is well provided. Railways, excellently built and equipped, run everywhere. Seaports are numerous, with the best of harbor facilities. There are no better highways in any country, and the small area of the island enables all the large manufacturing centres to be within easy reach of the sea.

The merchant marine of England far exceeds that of any other country. English ships are to be seen everywhere; no port in the world escapes their visits, and they carry on trade with all nations, the largest being with the United States, the next in order being with France, Germany, Netherlands, Belgium and Russia.

Centres of Commerce.—Of the British cities London stands first, with a population of more than 4,500,000 and an immense commercial business. It is also the chief financial centre of the world. Liverpool comes second among the seaports and Manchester has been made an important port by its ship canal. Cardiff and New Castle are coal-shipping ports, and Glasgow, Hull, Plymouth and Southampton have each their share of the shipping trade. To the manufacturing towns named may be added Wilton and Kidderminster, famous for carpets, Worcester and other cities for pottery, Bradford for woollen and Dundee for jute goods. All these are English cities, Glasgow being the chief industrial centre of Scotland and Belfast of Ireland. Edinburgh and Dublin, the capitals and chief cities of Scotland and Ireland, have no active industries.

Germany.—Next to Great Britain in industrial importance among the nations of Europe comes Germany, the most active and ambitious of the continental nations. Up to 1870 this country consisted of four kingdoms, Prussia, Bavaria, Saxony, and Würtemberg, with a considerable number of small states, some of them no larger than an American county. In 1871, after the war with France, all these joined in a political union which constitutes the present Empire of Germany, the separate states preserving a local independence, as do the States of our country. The formation of the empire was followed by a rapid development of the industries of the nation, with the result that Germany has surpassed in this respect all the other nations of the continent.



Situation and Surface Conditions.—Germany occupies a central position in Europe, being surrounded by Russia, Austria, Switzerland, France, Belgium and Holland on the east, south, and west, and by Denmark and the Baltic and North Seas on the north; with an area of over 200,000 square miles and a population of about 64,000,000. It consists of a high tableland in the centre and south, from which rise numerous ranges and groups of mountains, and in the north of a great sandy plain, extending from its central region to the Baltic Sea and including nearly half its area. The climate is temperate, the rainfall abundant, and the people intelligent and industrious.

The Grazing Region.—Much of the soil of Germany is poor, but very careful cultivation has made it productive. This poverty of the soil is especially seen in the great northern plain, with its forest-covered sandy stretches. Here the grain product is small except in the flood-plains of the rivers. But a large part of it is well adapted for grazing, and more cattle are raised here than in any country in Europe, except Russia. The animals are of high grade and the dairy products of the finest quality. The cattle of Sleswick-Holstein have a world-wide fame and many of them have been brought to America to improve its stock. Horses are also raised in large numbers, the Government buying most of them for its cavalry service. The sheep, formerly in large number, are giving way to the extension of farm lands, but swine are kept in multitudes, cheap food being abundant in the refuse of the sugar-beet factories.

Farming Crops.—In the highland region there is much poor soil, but the farm products there are very large, the ground being cultivated with great care and intelligence, with the result that the average yield of grain per acre is double that of the United States. Of the grains, rye is the most largely cultivated, rye bread being usually eaten by the poorer classes. The crop, however, is not enough for the needs of the people, and the United States, with Argentina and Russia, supply much of the wheat and flour needed, while rye is largely imported from Russia. Other crops are oats and potatoes, the latter in large quantity, as a main article of food. But the most important farm product of Germany is the sugar-beet. Germany, in fact, is the largest sugar-producing country in the world, its annual crop being about 2,000,000 tons. A large part of this comes to the United States, the Germans eating much less sugar than our people.

WITHIN A GERMAN KITCHEN.

The Forest Region.—Forests cover about one-fourth the area of the German Empire, embracing the rugged mountain districts and much of the plain, and supplying large amounts of lumber. Here no waste is allowed. The Government controls all the forest operations; the cutting of trees is conducted with wise discrimination, and for every tree cut another must be planted. Thus, while yielding timber in abundance, the forests do not decrease.

Mineral Products.—The hill-country is also rich in minerals. Coal and iron are abundant and the mining operations are on a large scale. The coal and iron are found close together, and this has helped to make Germany a great manufacturing country, especially in iron wares. Coal is found in abundance along the Ruhr River, near the Rhine, with large iron mines near by, and in the west are other large iron and coal fields. Other minerals of importance are silver and zinc, and copper is mined to some extent. Salt is produced in large quantities, there being mines of rock salt of immense extent.

Iron and Steel Manufactures.—As a manufacturing country Germany ranks third among the nations, being surpassed only by the United States and Great Britain. As in England, her leading products are textiles and iron and steel goods. Every kind of iron and steel products are made, from a nail or needle to a steel-clad battleship. The cheapness of transport along the rivers and canals enables these industries to be conducted profitably in all parts of the empire. Of the iron and steel works, the greatest is the immense Krupp plant at Essen, which employs 40,000 men and produces steel rails, cannon, steel plates for warships and other articles in abundance. Machinery, cutlery, and goods of many other kinds are made in the German shops beyond the needs of the people, the exports of steel goods being much larger than the imports. Germany buys no articles of this kind unless they are cheaper or better than those made at home.

Textile Products.—The mills of Germany are kept busy turning out cotton and woollen goods, and the Germans come next to the British as buyers of American cotton. Steamers ascend the Rhine with freights of cotton bales and unload at the manufacturing cities, most of the cotton mills being along this river. Saxony is a centre of the woollen manufacture, using the wool from Saxon sheep.

There are also many mills in Silesia and along the lower Rhine, these using imported wool. Linen and silk goods are also made, Italy furnishing the raw-silk for the latter and the surrounding countries supplying flax.

Other Manufactures.—The leather industry gives employment to a large number of workmen and chemistry is greatly advanced, no other nation equalling Germany in this field and in the making of scientific instruments. The United States is a large customer for these products. Another manufacture of leading importance is the brewing of beer, the Germans being the greatest beer-drinkers in the world, as much as 130 quarts a year being consumed for each member of the population. About one-third of this product is made in Bavaria, while the vineyards of the Rhine and the Moselle furnish large quantities of wine.

Gathering Grapes on the Rhine.

There are many other industries, ranging from the building of some of the finest and largest ocean steamships the world possesses to the manufacture of wooden toys, which is a common industry of the German home.

Transportation.—No country surpasses Germany in its facilities for cheap transportation. There are railways in all directions, their length ranking next to those of the United States. There are over 1100 miles of coast, with good harbors, and a connection between the Baltic and North Seas, by way of the Kaiser Wilhelm Canal, twenty miles long. This saves the shipping of the Baltic the often stormy passage between Denmark and Scandinavia.

A number of navigable rivers cross the empire, chief among them the Rhine and the Elbe, Europe's greatest inland commercial routes. There are many canals, extending from river to river, and connecting the German streams with those of Russia, Austria and France; so that bulky goods can be carried very cheaply from place to place. These supplement rather then compete with the railways, which carry the goods which demand quick delivery, so that transportation is admirably systematized. For ocean traffic there are provided steamship lines which have some of the largest and best vessels afloat and a merchant marine which is not surpassed.

Commerce.—In commercial importance Germany ranks next to Great Britain among the countries of Europe and resembles the latter in the fact that its imports are composed in great part of food and raw materials and its exports of finished goods. From the United States it gets cotton in large quantities, also corn, wheat and oats, coal-oil, bacon and other meats, copper, lumber, shoes, agricultural implements, etc., buying from us $100,000,000 more value in goods than it sends us. Austria, Russia and Argentina also supply grain, and wool and other raw materials are brought from various countries.

The exports of Germany are chiefly the product of her workshops, such as chemical materials, woollen goods, scientific instruments, beet-sugar, etc., to the United States; cotton and woollen fabrics to South America, and various other products to different countries. The total sum of its imports and exports amounts to nearly $3,000,000,000, nearly the same as that of the United States, though in Germany the imports exceed the exports considerably in value.

Seaport Towns.—The great shipping trade is centred in a number of active seaports, chief among them Hamburg, a city coming next to London and New York in the immensity of its trade and handling nearly half the foreign commerce of the empire. Bremen is another leading North Sea port, and on the Baltic are Lübeck, Stettin, Kiel, Königsberg and Danzig. Of these Stettin and Kiel are notable as being the great shipbuilding centres of the empire, and Kiel as the headquarters of the Baltic navy.

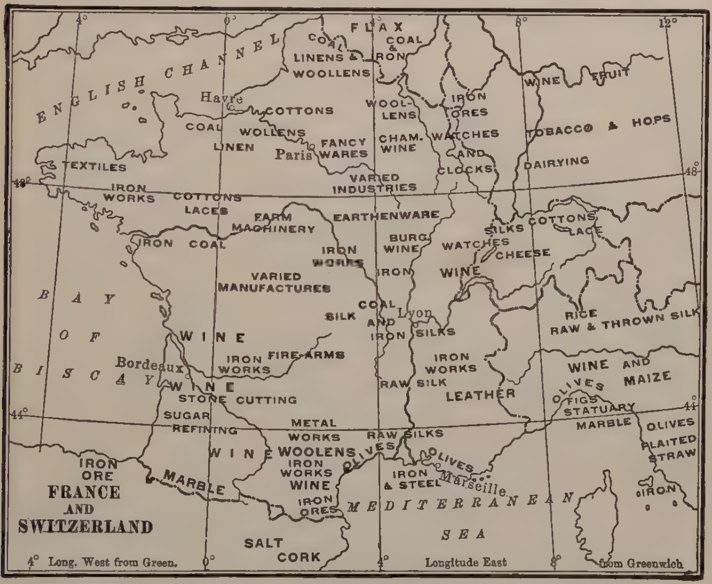
Inland Cities.—Berlin, the capital, ranks high among the great cities of the world, having a population of over 2,000,000, and a large industrial activity. Financially it is one of the great money markets of the world. It is an important railway centre, as is also Dresden, at which the railways of Saxony converge. Breslau, in Silesia, is an important market town for the distribution of raw materials to the manufacturing districts.

Among the chief centres of manufacture are Essen, the seat of the Krupp steel works; Barmen-Elberfeld, a great centre of cotton weaving; Chemnitz, notable both for cotton and woollen mills, and Dortmund, a city of iron and steel works and breweries and a market for coal distribution. Among the important trade-centres are the large cities of Leipzig, Cologne and Munich. In the hill-country south of Breslau there are no cities, the people working in their homes, where they spin and weave the flax and wool from the farms, make lace, and carve wood.

CHAPTER XXIII.

FRANCE, SPAIN, PORTUGAL AND SWITZERLAND.

The Republic of France.—There is no more interesting country in Europe than the former kingdom, now the republic, of France. In history it stands first and in industrial progress it has few rivals. It would be hard to find a people who get more from the earth than the farmers of France, while its artisans are notable for their industry and artistic skill and taste. For commercial purposes it is fortunately situated, having a large water frontage on the Atlantic and a considerable one on the Mediterranean.



The result of its natural advantages and the industry and intelligence of its people is that in estimated wealth it stands third among the nations, being below the United States and Great Britain but above Germany.

Surface and Farms.—France has a milder and sunnier climate than Great Britain, lying almost wholly south of that island and extending to nearly ten degrees south of the latitude of London. Highlands and mountains mark its surface to the south and east, but it slopes off to the north and northwest, where it becomes quite level, forming a great fertile plain, admirably adapted to the work of the farmer.

While smaller than the State of Texas and with less than half the population of the United States, it has more farmers than this country. In former times the land was held by the nobles and divided up into great estates. The French Revolution put an end to this, the land being sold to the common people and divided up into small farms, which now average only about fifteen acres each. This makes it very different from Great Britain, Spain and Italy, where great estates still prevail and few of the people are able to own their farms.

The Wheat Crop.—In the old days the poor people of France lived on rye bread, as do those of Germany and Russia to-day. Now they have risen to the stage of wheat-eaters and wheat has largely taken the place of rye in their fields, so that France is to-day one of the great wheat-growing countries of the world. Only the United States and Russia surpass it in this crop, its annual harvest being about 300,000,000 bushels, nearly half that of the United States. Yet the demand for wheat bread is so great that this large crop does not supply the people's needs, and much wheat is bought in this country and in Argentina. There are large crops of oats and rye, but wheat surpasses all the other grains.

Sugar and Tobacco.—Another important crop is that of the sugar-beet, which is grown in the far northern section, the sugar being refined at Paris and other cities and largely consumed at home. England takes nearly all the sugar export. Tobacco is grown, but this is a Government monopoly, and its growth is forbidden except in the most favorable regions. In consequence considerable quantities of leaf tobacco are imported, this being manufactured in a number of large workshops. The product of these is valued at about $70,000,000 yearly.

Gathering Grapes for Wine Making.

Fruit Culture.—The farmers of France are very diligent and obtain from the earth all it is capable of yielding, the soil being kept in a high state of fertility and the most advanced methods used. In addition to the field crops there is a large yield of fruits, including apples, pears, olives, and other fruits fitted to a climate like that of our South Atlantic States. They are raised in quantities that permit an abundant export and no better fruits are produced in any lands.

Among the fruits the grape ranks high, France being the leading country of the world in grape culture and the making of wine. The soil and climate of the south and east are admirably adapted to this fruit and French wines are sent all over the world. Three-fourths of these are red wines. The most prized and costliest of the wines is champagne. Farther north much cider and beer are made.

Animal Products.—The animals kept on French farms are largely cattle, in addition to which many cattle are imported for beef. Dairying is an active industry in the north, and much butter is sent to England. There is also a large demand abroad for the choice French cheeses, which are famous for their fine quality. Poultry are kept in large numbers and millions of eggs are shipped to England. The sheep are of high grade and yield choice wool, which is used to make the finest cloths woven in the French factories. Many horses and mules are raised, including the huge Percheron draught-horses.

No other country in Europe surpasses France in the product of its fisheries, the cod fishers extending their work from the North Sea to the waters of Newfoundland, which have been worked by them since the days of John Cabot. Sardines are one of their leading products, these being canned and sent to all parts of the world. Oysters are cultivated along the Atlantic coast and, though inferior in size and flavor to those of American waters, find a ready market.

Wood and Minerals.—Lumber is scarce in France, the mountains and hills having long ago been robbed of their forests. As wood is the common house-fuel, large quantities have to be brought from abroad, Scandinavia supplying much of it. Coal and iron are also not sufficient for the demand and much of these need to be imported to supply the iron works. Though France ranks fourth among the iron-producing nations, its yield of iron is far below those of the three leading iron-making countries, the United States, Great Britain, and Germany. The principal coal beds lie close to Belgium and are a continuation of the large coal deposits of that country.

Manufacturing Industries.—As a centre of manufacture, France comes next to Germany and stands fourth among the nations. In elegance of design and artistic finish it stands first. Many of the workmen have been trained in art and their training is shown in the fine finish and beauty of their products. Paris is the manufacturing centre of the country, and here and elsewhere throughout the north most of the factories are to be found, though there are many in the south.

The most important field of industry is that of the weaving of woollen, cotton and silk goods. More than a million work-people are engaged in this labor and the goods produced are of the finest and most tasteful quality. The silks of France are famous everywhere for beauty and elegance, and find a ready market in foreign lands. The raw silk is obtained from Italy, China, and elsewhere and woven in Lyons, Paris and other cities, Lyons being the greatest producer of silk goods in Europe.

The cotton industry has its chief centre in Rouen. Lille and its environs form another centre. In dyeing and calico-printing France is unsurpassed. Woollen cloths, carpets and tapestries are also large products and form the greatest item of French exports. There are linen mills in Lille and other cities, the flax being obtained from Belgium and Russia.

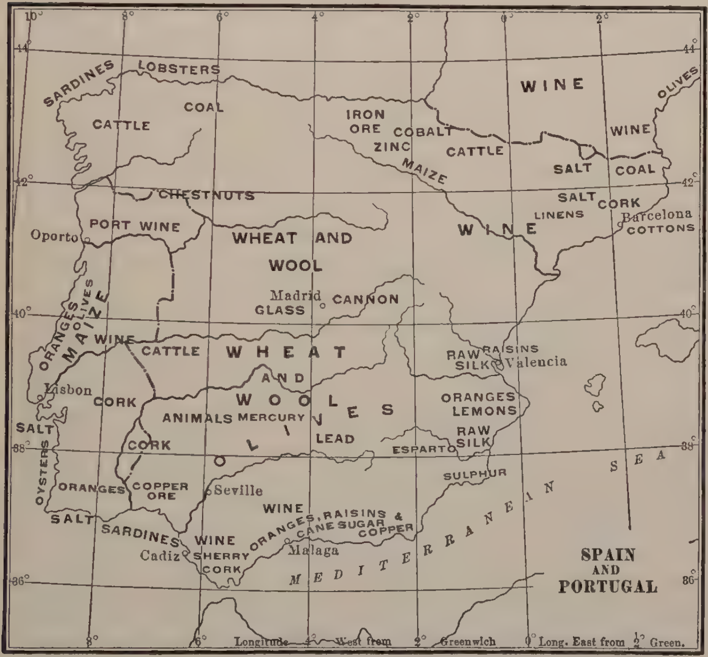
Among the industries of France the working of leather stands high, there being great shoe factories in all the large cities. A famous industry is the making of kid gloves, and other factory products are ribbons, hats, millinery, perfumery, cut-glass, and numerous small wares. The porcelain of France is of very fine quality and finds a large market abroad.

Transportation.—Its rivers, canals, and thousands of miles of railway give France a great opportunity for the inland movement of goods, there being in all about 7000 miles of navigable waters and more than 25,000 miles of railway. But, despite the great length of seacoast, good harbors are few. Marseilles, on the Mediterranean, is the leading port; Havre, on the English Channel, the next in importance. The former is also largely engaged in manufacture, but Havre confines its activities to commerce. By deepening and widening the navigable rivers, practically making canals of them, the facilities for inland navigation have been much increased.

Commerce.—France has a merchant marine of more than 15,000 vessels, the fixed policy being to carry French traffic in French vessels. To protect it there has been developed one of the strong navies of the world. Yet the products of France are largely consumed at home and the importation of raw materials and food considerably exceeds the exports of finished materials. These exports are chiefly the fine woven goods of the country, the artistic products and novelties of many kinds, and the wine, sugar, and dairy products.

Chief Cities.—Of the cities, Paris stands first as the largest city on the continent of Europe and an important centre of manufacture, commerce, finance, art, and literature. In addition to the industrial cities mentioned may be named Bordeaux, the chief port for the export of French wines; Lille, Le Creusot, and St. Etienne, the centres of steel making; Rheims, noted for shawls, and Roubaix, one of the centres of woollen manufacture.

Colonies of France.—France has long ranked among the colonizing countries. At one time it held possession of Canada and the Mississippi Valley and many of the people of Quebec and New Orleans still speak the French language of their ancestors. Of all the possessions of France in America there now remain only French Guiana, some small islands in the West Indies and two fishing islands near Newfoundland. But in Asia, France holds a large section of Indo-China and in Africa it has the important colonies of Algeria and Tunis and a vast area in the Sahara and the country south of it. It also holds the large island of Madagascar and some other Pacific islands.



SPAIN.—Spain and Portugal are in physical and industrial conditions one country, and have at times been combined politically, so they may fairly be treated together. Once among the great nations of Europe, they are now among the weak ones. Enterprise and industry long since died out in them and has only within the present century begun to revive. Thus, in regard to industrial and commercial conditions there is not much to be said in their favor.

These countries occupy a large peninsula lying south of France, but while the latter country teems with industry, indolence rules in the Iberian Peninsula. Separated from France by the Pyrenees Mountains, Spain and Portugal are in great part a plateau region, from 2000 to 3000 feet high, from which rise many short, broken mountain ranges. This plateau is bordered on the north by the Pyrenees and on the south by the lofty Sierra Nevada Mountains, the only lowlands being narrow strips along the Mediterranean and Atlantic seacoasts, with others in the valleys of the Ebro and Guadalquiver rivers.

Climate.—Spain extends as far south as does Italy, but has little of the pleasant climate of that warm land. It has hot summers, but the winters are often very cold, except in the lowland region, and the mountains cut off the moist winds so that the rainfall is small. On the Atlantic coast there are heavy rains, but in the vicinity of Madrid the annual fall is only about ten inches—too little for agriculture without irrigation.

Agriculture.—On account of the rugged and elevated character of the country and the small rainfall, much of the country is too arid for success in agriculture and less than half of it is farming land. While there is considerable irrigation, it does not extend far into the interior, the best watered land being along the Gulf of Valencia, on the Mediterranean. There is here an admirable system of irrigation, introduced by the industrious Moors of the past, and still kept up, so that three or four crops are raised annually. Wheat is the most abundant farm crop, since this needs less rain than the other grains. In its wheat harvest Spain has a good record, the crop running as high as 120,000,000 bushels. Much more might be produced but for the slow Spanish ways and lack of enterprise. Their farming methods are those of a century or two ago.

Rye, barley, corn and rice are also grown and these are much used as food. In the lowlands fruit is raised in great abundance, including such semi-tropical kinds as olives, figs, dates, oranges and lemons, the growth of the olive being a large industry and its oil used in place of butter. Grapes are also an abundant crop and wine is the largest export of the country. This includes the famous port wine of Portugal, and the Malaga and Alicante wines of Spain, for all of which there is an active market in England and the United States. Another kind of grape yields the well-known Malaga raisins.

Animal Products.—While the uplands and mountains, with their arid climate, are not favorable to farming, they are well adapted to grazing, especially for sheep and goats, which thrive better in a dry climate than cattle. In summer these feed on the mountains, but in the winter they are driven down to the lowlands. Flocks of sheep, ten thousand or more in number, may be seen under the care of a group of shepherds and their dogs. Many of them are of the merino breed, yielding the famous merino wool. The goats are kept for their milk and skins.

In the rainy northwest region many cattle are kept, the dairying industry being there of some importance. While little attention is paid to horses, Spain is famous for its fine mules and much care is paid to the breeding of donkeys, these animals being well fitted for the rugged mountain paths of the Spanish highlands.

The Cork Industry.—Forests are lacking and Spain has to import most of the lumber needed, but there is one tree that is of great value. This is the cork-tree, a species of oak which bears a thick, light, spongy bark and which supplies the world with the corks so widely used for stoppers of bottles, casks, etc. It is also used in life-belts, net-floats, and for the inner soles of shoes. The tree lives to be 150 years old and yields a crop of bark every eight or ten years.

Minerals.—Spain is rich in metals and minerals, but the usual lack of enterprise is shown in mining operations, those which exist being largely conducted by foreigners. The quicksilver mines of Spain have been famous for many centuries, and no other country in the world has such rich mines of this useful metal. Copper and lead are very abundant, Spain coming next to the United States in its yield. Coal and iron are also found, but little advantage is taken of them. The rich ores of the north are sent to Germany and England to be made into steel, while the coal mines are greatly neglected. As for manufacturing enterprise, it is nowhere active or sufficient to supply the needs of the people.

Transportation and Commerce.—There are very poor means of transportation, including short lengths of navigable rivers and railroads which are poorly equipped and very high in their charges. The broken character of the surface renders traffic difficult and much of it still depends on the pack-train and the ox-cart of a past age. Spain has almost no merchant ships, depending on those of England and France. The chief exports are iron ore, and quicksilver, cork, wines and fruits. The imports are chiefly cotton, coal, lumber and food-stuffs.

Principal Cities.—Madrid is the capital and principal city of Spain, the next in size being Barcelona, which is at once the leading seaport and the chief centre of manufacture. Valencia is the second port in importance, it being surrounded by a garden-like country the fruit-yield of which it sends abroad. Other ports are Cadiz, Malaga, Santander, Bilbao and Cartagena. The latter is a fortified seaport with a fine harbor and many manufacturing industries.

PORTUGAL.—Of the industrial and commercial story of Portugal there is little more to be said, since it is well covered by what has been said of Spain. Formerly this small country rivalled Spain in the extent of its colonial possessions and held in Brazil nearly half of South America. While Spain has lost almost all her colonies, Portugal still holds the Madeira, Cape Verde and Azores Islands, small provinces in India and China, and large areas in East and West Africa. But these are handled in a way to make them of little importance to the home country.

Industries.—Farming and the fisheries are the chief Portuguese industries. Much wine is produced, especially the well-known port wine, which gets its name from Oporto, its shipping point. This is made in great quantities, the lower port of the Valley of the Douro being one of the richest wine districts in Europe. Other shipments are of cork, copper and fruits. The foreign trade is about one-fourth that of Spain.

Chief Cities.—Lisbon and Oporto are the chief cities of Portugal. Lisbon, the capital, is finely situated at the mouth of the Tagus River, on one of the finest harbors in the world. As a city it is highly attractive, its white houses being partly buried in green trees on the hill-sides around the harbor. Oporto is also beautifully situated and has a large commercial trade.

SWITZERLAND.—In the heart of the highest Alps lies the mountain-girdled republic of Switzerland, with an Alpine range in the south, the Jura Mountains in the northwest, and between them a hilly plateau from 1000 to 2000 feet high. It is on this low plateau that most of the people live, occupying themselves in farming the well-watered soil or in busy labors in the cities. Half the country is too high for prosperous agriculture, grass clothing the mountain sides up to the zone of snow and supplying food in summer to large herds of cattle. These are kept for dairy purposes, the cattle for beef being largely imported from neighboring countries. Goats are raised for their hides, which are converted into Morocco leather. Of dairy products, cheese is much the most important, the Gruyére cheese of Switzerland having a world-wide field of export. Schweitzerkäse is another favorite kind.

Preparing Cheese for Market, Switzerland.

Farm Products.—Switzerland has little land fitted for the farmer, not more than one acre in nine being adapted to cultivation. Yet these are tilled to the utmost, agriculture and dairying being the principal interests of the country. Wheat and rye are grown, but a larger quantity has to be brought from foreign lands, Austria, Russia, and the United States supplying the deficiency.

On the sunny slopes of hills and mountains, orchards and vineyards are planted, apples, cherries, grapes and other fruits being raised. These find a ready market in the surrounding countries. Silkworms are kept and raw silk produced for the mills, but far from enough, much being imported for the busy looms.

Lumber and Minerals.—There is much woodland on the mountains, chestnut and walnut trees on the lower levels, beech, maple and other hardy woods farther up, and the hardier evergreens where the mountains ascend towards the zone of ice and snow. Dwarfed trees, shrubs and grass form the topmost line of vegetation. Despite the mountainous character of the country, there are few useful minerals. Building-stone and rock-salt are the principal. There is a small quantity of coal and a little iron ore, but nearly all the fuel and iron needed have to be imported. Yet the numerous mountain streams yield an abundant water-power and the Swiss take full advantage of this in their factory operations.

Manufactures.—Though Switzerland is entirely inland and has no navigable waters other than its lakes, its excellent highways and thoroughly equipped railway system enable it to import raw materials cheaply, and it has many active manufactures, chiefly of light articles such as silk and fine cotton goods, watches, clocks, jewelry, music boxes, and fine machinery, the light weight of these enabling them to be sent abroad cheaply. Swiss watches were once very largely sold in the United States, but the competition of American watches has greatly injured this trade, and the mechanical music-player with its perforated records has cut off the demand for music boxes. Yet the Swiss workmen manage to keep busy, their silks finding a very large demand, and their exquisite brocades, as also their fine muslins, made on hand looms, being nowhere surpassed. The Alpine herdsmen occupy themselves during the cold winters by whittling out wooden toys to please the children of far-off lands. In summer a host of sight-seeing tourists invades the country and makes business thrive.

Cities.—Geneva is the chief centre of trade and is notable for its active watch-making works. Other industrial cities are Zurich, with its textile and machinery factories, Basel, in which the silk-brocade works are kept busily ememployed, Glarus and St. Gaul, also centres of the textile industries, and Neuchatel, Bern and Vaud, where watch-making is carried on. Wood-carving, introduced in the Oberland about 1820, employs about 4000 persons.

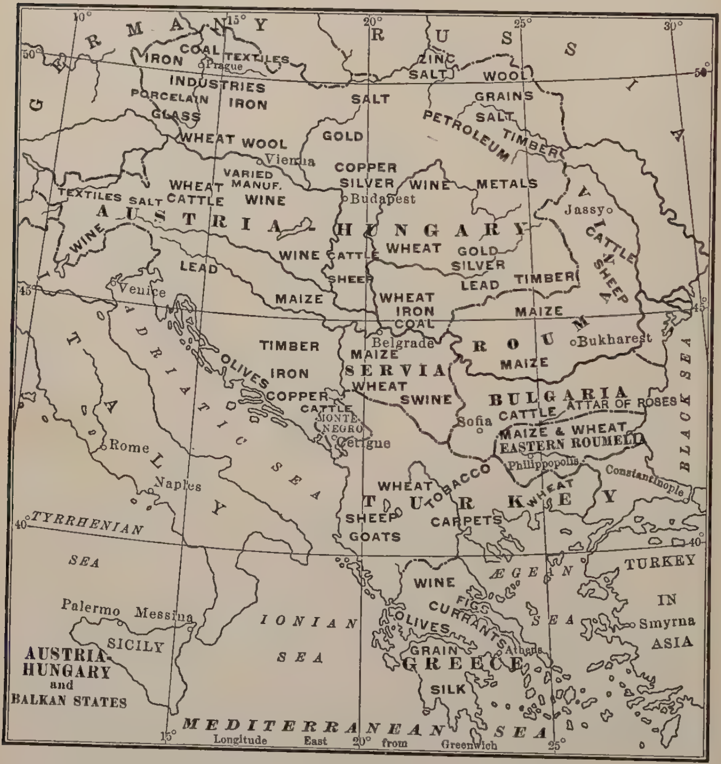
CHAPTER XXIV.

CENTRAL AND SOUTHEASTERN EUROPE.

Austria-Hungary.—Largest of the European countries after Russia, and the most central, from the fact that it lies inland between the maritime countries, having little available seacoast, is the combined realm known as Austria-Hungary. In this we have two nations under one monarch, who is at once Emperor of Austria and King of Hungary, but each country retains its own government and its own language. The population indeed includes several different races, each speaking a separate language and having special customs, and there is much hostile feeling, especially between the Germans of Austria and the Magyars of Hungary. There is little of the community of interests that we find between the Kingdoms of Germany or the States of our own country, and eventually the nation may break up into its several racial parts.

Aspect of the Country.—This state of affairs has stood in the way of progress in Austria-Hungary. Another thing which affects its progress is the fact that it is one of the most mountainous countries in Europe, the greater part of it being walled in between the ranges of the Alps in the south and the Carpathians in the north and east. Its mountain borders and inland positions stand in the way of its having an active commerce, its only seaports being Trieste and Fiume, on the Adriatic Sea, beyond the mountain barrier. Its great commercial river is the Danube, which flows to the Black Sea, there being no important streams running to the ports of the south.

Agriculture.—For the reasons given, Austria-Hungary has not become an active commercial country, agriculture being its most important industry. In products of the soil it is rich. This is especially the case with Hungary, which is one of the harvest fields of the world. On the broad and fertile plains bordering the Danube and extending eastward from it the cereal crops, and wheat in particular, are grown in abundance. It is this grain that gives the country its importance in agriculture, the wheat harvest being the largest in Europe, except those of France and Russia. As the people live largely on rye, much of the



wheat is sold to other countries, the Hungarian flour being carefully milled, and bringing a high price. Potatoes are grown in enormous quantities, but they are all eaten at home.

Sugar and Wine.—Bohemia, in the northwest, also yields much grain, this having an easy route to market by the channel of the Elbe River. The sugar-beet, a very important crop, is also grown here. Austria stands second among the beet-sugar countries of the world and third among all the sugar countries, Germany and Cuba alone surpassing it. In the south the grape is largely raised, some of the Hungarian wines being highly esteemed. The choicest vintage is the Tokay, the best of the Tokay wines being among the favorite vintages of the world.

Animals and Forests.—Much of the land is devoted to pasturage, about one-fourth the area of the whole country being thus utilized. Horses are raised in large numbers and Hungary is famous for its fine mules. There are also large herds of cattle, though the best breeds have not been introduced. Many of these animals find a market in the surrounding countries. The broad upland regions of the empire are widely forested, the woodlands being estimated to occupy one-third of the whole country. These are carefully handled and their lumber finds a ready market abroad.

Mineral Products.—The mountains of Austria-Hungary are rich in minerals, though the mines are not largely developed. Coal and iron occur in abundance, but are not close together, and most of the coal is not suited for iron and steel manufacture. Yet much steel is made. While it costs more to produce than German steel, competition with the latter is favored by the saving of freight charges.

Gold and silver are products of some importance. There are very productive lead mines about Bleiberg, and quicksilver mines of excellent yield at Istria. An important product is salt, the rock-salt beds near Krakow being twelve hundred feet thick and practically inexhaustible. They are penetrated by thirty miles of galleries, in some of which are built the villages of the miners.

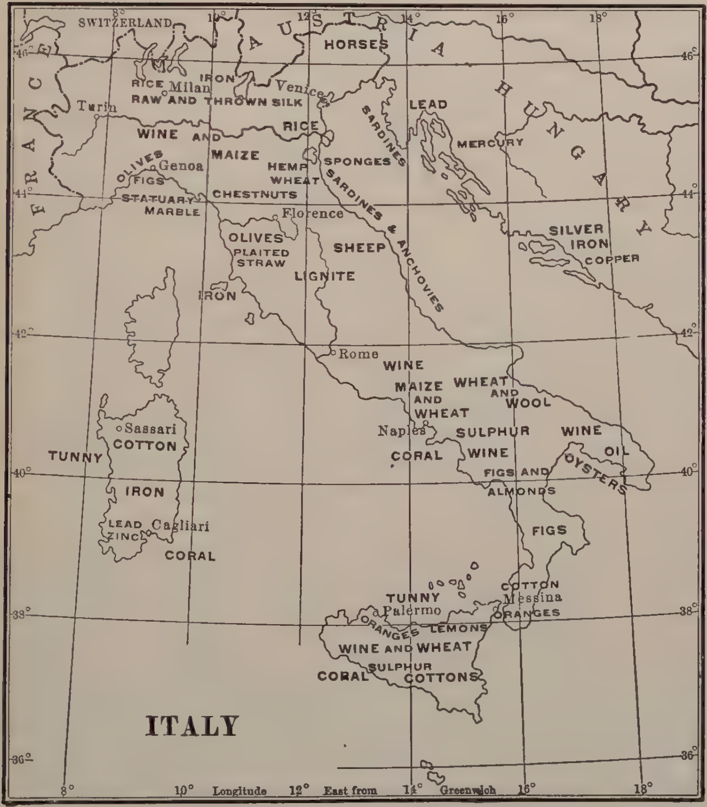
Manufactures.—Austria manufactures few goods beyond those needed for home use. The flour mills at Budapest are fitted with the best machinery and turn out a very fine product. The roller method of flour-making, now in use in our own mills, is a Hungarian invention and was first used in Budapest. The most important products are gloves and glassware. There is a world-wide demand for Bohemian glass and the gloves of Austria are also largely exported. From Pilsen and Vienna come beer of the highest quality, everywhere esteemed, and from Vienna also comes the well-known Austrian bent-wood furniture.

These are the chief exported materials, the products of the cotton, woollen, silk, and paper mills being consumed at home. Much of the manufacturing is still done by hand or with simple machines, but considerable progress is now being indicated.

Transportation.—The Danube and the Elbe form natural channels to the Black and Baltic Seas, and the Danube is connected by the Ludwig Canal with a tributary of the Rhine, so that by this channel a boat can pass from the North to the Black Sea. There are many railways in operation, but owing to the limited coast-line and the isolation of the seaports by mountain ranges, the opportunity for foreign commerce is greatly restricted, though there is an extensive internal commerce. The chief exports have been named; the imports are largely of raw materials.

Centres of Industry.—While Austria-Hungary has many small cities, it has only two of large size, Vienna, the capital of Austria, and Budapest, the capital of Hungary. Vienna, the fourth city in size in Europe, is a great railway and trade centre. Budapest is much smaller, but is seated in the midst of the great wheat plains of the Danube

Valley and deals largely in grain-shipment and the manufacture of flour. Prague, on the Elbe, is important as a manufacturing and commercial city. Trieste is the largest seaport, and Fiume, which lies southeast of Trieste, has an excellent harbor and handles much of the exports of Hungary.



Italy.—From the Alps, which run east and west, a spur extends several hundred miles to the south, known as the

Apennines. This forms the backbone of the Kingdom of Italy, which is a peninsula extending southward into the Mediterranean. It is composed of plains bordering the mountains and extending on both sides to the sea. Italy includes the islands of Sicily to the south and Sardinia to the west, but its whole area is little more than that of the State of Colorado. Yet it is thickly peopled, having a population of over 32,000,000.

Farming Products.—Italy has always been an agricultural country. It has a mild climate, rain in sufficient quantity, and much fertile soil. Irrigation is also largely practised and several crops a year are often produced. The most important farming region is the great plain of Lombardy, crossed by the river Po, the valley of which is of exceptional fertility. Here wheat is extensively grown, the annual crop of the country being about equal to that of Hungary. But there is not enough for the needs of the people and much has to be imported. Indian-corn is also largely grown and in the form of polenta (equivalent to our mush or hasty pudding), forms the chief food supply of the peasantry.

Flax and hemp are grown in the north, and cotton in the south and in Sicily. A very important product of the farms is raw-silk, much attention being paid to the culture of the silkworm. This is mostly produced in the north and finds a ready market in the silk mills of the United States and Western Europe.

The fruit crop comes next in importance, olives being its most important product. Both the preserved fruit and the oil are exported in large quantities, while at home the oil largely takes the place of butter and meat. Sicily, an island of semi-tropic climate, raises great quantities of oranges and lemons for the foreign market. The grape crop is an enormous one, and Italy comes next to France as an exporter of wine.

Animals and Minerals.—Comparatively few cattle are raised, the Italians eating very little meat. Mules and donkeys are more important, the donkey being a common aid to the farmer. The sheep supply only part of the wool needed for the mills. Goats live in thousands on the mountains, goat and kid skins being articles of export. The fisheries are prolific, employing many thousands of men. Among their products is that of the favorite red coral of Sicily and Naples.

As regards minerals, the Apennines are greatly lacking. Some iron is produced, but there is no coal, and the chief mineral products of Italy are the famous statuary marble of Carrara and the sulphur which Sicily yields in abundance. Much of the world's sulphur comes from this island.

Manufactures.—Though coal is wanting, there is much water-power, though in many cases it is cut off in certain seasons by the streams running dry. Yet cheap labor is plentiful and much work goes on. Silk-weaving is the greatest industry and, with raw silk, supplies one-third of all the exports. The cotton, woollen and linen mills' products are all consumed at home.

Aside from these are art objects, such as Venetian glassware, jewelry, lace, pink-coral ornaments, statuary, woodcarving and straw-plaiting. Coal has been imported within recent years and the Italians are making steel rails and steel-clad ships at home.

Transportation and Commerce.—The peninsular character of Italy and its long, slender shape give it a very extended seacoast and excellent harbors. Lying midway in the Mediterranean, it has long enjoyed a profitable carrying-trade eastward and westward and many of the people follow the sea. The railways, formerly local in character, have been combined into trunk lines traversing both coasts, while by means of the several great tunnels cut through the Alps, France, Switzerland, and the other northern countries are easily reached.

The exports embrace silk, olives, marble, sulphur, oil, wine, fruits, art works, etc. The imports are cotton, wheat, textiles, coal, lumber, iron, steel, machinery and various other articles.

Leading Cities.—Italy has numbers of famous cities, but most of these are unimportant from an industrial or commercial standpoint. Rome, one of the most famous cities of the world, has no industrial importance, and the same may be said of Florence and some other noted cities. Milan is a railroad centre and a market for the Lombardy crops, and Leghorn is a centre of the straw-goods manufacture. Genoa is the port traded with by United States merchants, and Naples that which receives the trade of Great Britain. Sicily has its commercial centre in Palermo and ships its sulphur from Catania. Venice, once the greatest of commercial cities at the date when nearly all maritime commerce was confined to the Mediterranean, has long ceased to be an important centre of commerce.

THE BALKAN PENINSULA.—Southern Europe is marked by three great peninsulas, extending southward into the Mediterranean, that of Spain and Portugal, in the west; that of Italy, in the centre; and that known as the Balkan Peninsula, in the east. The last named, often called the bridge between Asia and Western Europe, once composed the large empire of European Turkey, but is now divided into a series of small States, Turkey retaining little of its once great European area.

This peninsula lies between the Adriatic and Mediterranean Seas on the west and the Ægean and Black Seas on the east and derives its name from the Balkan Mountains which occupy much of its surface, spurs extending southward into Greece. North of the Balkans runs the Danube River, with broad plains on both sides, bounded by the Balkan and Carpathian Mountains. This wide and fertile plain of the Danube is the garden spot of the Balkan

Peninsula. It includes the two Kingdoms of Roumania and Bulgaria, the former lying in great part north of the Danube, the latter wholly south of it.

Roumania.—This country, with its broad, fertile plain between the Danube and the Carpathian foot-hills, is chiefly notable for its grain product, wheat being raised in large quantities for export and maize as food for the people. Oats, rye, rice and tobacco are also grown and wine is made. All these except maize, or Indian-corn, are exported, the corn being consumed at home. Many cattle are kept and the country is rich in minerals, but none of these are mined except rock-salt and petroleum.

Roumania has railways between its capital and its other towns, but the Danube is its principal channel of grain export. Its imports reach it by sea and rail from neighboring countries. Bucharest, the capital and principal city, is an active centre of trade, having railway connections with Austria and with the other Balkan states.

Bulgaria.—The fertile plain of the Danube extends southward into Bulgaria, its products being much the same as those of Roumania—wheat, maize, tobacco, and wine. The Balkan Mountains cross its southern section, and in these is the famous Vale of Roses, from which the world gets half its supply of the volatile oil of the rose, known as the attar or otto of roses.

In this valley the rose fields extend for a length of forty miles and are a vision of beauty when in bloom. To obtain the otto, the rose petals are distilled in about twice their weight of water, the product being then exposed to the cool night air in open vessels. A thin film of oil collects on the surface and is skimmed off with a feather in the morning. The otto of roses is much used for making delicate perfumes, its other sources being Turkey, Persia and India.

In addition to this product, Bulgaria also exports grain, cattle and hides, and imports textiles, metal goods, and other needed wares. Its most important manufactures are woollen cloths, carpets and leather goods. None of the Balkan countries has made much advance in the industries and most of their products are for home use.

SERVIA.—Servia, a small country, about equal in size to New Hampshire and Vermont, adjoins the two countries named on the east and Hungary on the west. Its chief crops are wheat and maize, much more being grown than is needed at home, so that there is an export trade in these grains. Its oak and beech forests are utilized for hog-raising, these animals being fed in large numbers upon acorns and beech-nuts. Pork, lard, and cattle are the principal exports, nearly all the trade being with Austria-Hungary. Belgrade, the capital and principal city, is an important centre of trade and manufacture.

MONTENEGRO.—Like Servia, the little mountain principality of Montenegro is a stock-raising country, importing everything it needs, except food, and exporting cattle to Austria. Two other little Balkan countries, Bosnia and Herzegovina, formerly part of Turkey, but long under Austrian control, have lately been annexed to Austria.

GREECE.—Going southward in the Balkan Peninsula, we find ourselves in the rugged little land of Greece, one of the most famous countries in the world. Of old it played a leading part in the political and intellectual development of the nations, though now it has become a country of small importance. In former times it had mines of gold and silver and a prominent position in commerce, but its mines are no longer productive and its commerce is of minor importance. One may say of it: "How have the mighty fallen."

Greece is largely mountainous and has little land suitable for farming. Its forests have been cut down and it has no coal or wood for fuel, no railways of importance, nothing to encourage manufacture or active trade. But it is surrounded in great part by the sea, no part of it being more than forty miles distant, and has many harbors, while it lies in the pathway of the commerce between Europe and Asia. As a result, the people of modern, like those of ancient, Greece are born sailors, and the Greeks take a very active part in the commerce of the Eastern Mediterranean, both as sailors and merchants.

On the hills of Greece vines and olive trees are grown, one of their important exports being currents, the dried product of a small grape. Some wheat is raised, but most of that needed is imported. Butter is also largely imported, the animals of Greece being chiefly sheep and goats, animals suited to a hilly country. The common goods needed for clothing are woven by the peasantry in their homes, but all finer fabrics are imported.

Athens, one of the most famous of cities, has sadly fallen from its proud estate, but remains the leading commercial and industrial city of Greece. Piræus, as of old, is its port. The shipments of currents, constituting half the exports, are made from Patras.

TURKEY.—Turkey, once extending over all Southeastern Europe, is now reduced in that continent to a region smaller than the State of Missouri, though it continues to hold a large area in Asia. It covers the territory of ancient Macedonia, extending from the Adriatic Sea on the west to the narrow channel of the Dardanelles and Bosporus on the east. Here stands its capital, at the gateway between Europe and Asia, the famous city of Constantinople, once the capital of the great Roman Empire and the leading city of the world.

The Turks have never been progressive and their country is in a very backward condition, its fertile soil being not half worked, its few manufactures carried on in the ancient manner, and its commerce chiefly controlled by Greeks, Armenians and Jews. Rugs and carpets are the most important exports, the rugs of Turkey being famous for their beauty and commanding high prices. The imports are textile goods, sugar, coffee, coal, petroleum, iron and other wares.

Turkey in Asia.—In Asia, Turkey possesses a territory ten times as large as that left to it in Europe. This comprises Asia Minor, Syria, the ancient Mesopotamia, and the western section of Arabia. The part of it of most industrial importance is the country of Asia Minor, which has much fertile soil and yields large crops of grain. The extension of railways is opening this region to commerce, and Smyrna, its most important city, is a very active seaport. Damascus, the leading city of Syria, is a centre of the caravan trade, and Beirut of textile manufactures.

CHAPTER XXV.

COUNTRIES OF NORTHWESTERN EUROPE.

Belgium.—Eastward from England and facing on the North Sea lie the two countries of Belgium and the Netherlands, small in dimensions but interesting in their political and industrial history. The people of Belgium have made their country what it is by their indomitable industry. Nature has done little for them. Only the most active and intelligent cultivation could have made fertile their sandy soil, while the low sand barrens near the coast have by untiring energy been converted into rich pasture-land and form a flourishing butter-making district.

In the southeast is the highland country known as the Ardennes, of little agricultural but much industrial value. The mountains here are very low, the highest point being 2230 feet, but they are a source of great riches to the state, since they contain extensive beds of coal. There are also iron deposits near the coal, the result being an active iron and steel industry. These hills also yield lead, zinc and silver.

Agricultural Products.—The farming industries employ more than half the people of Belgium, grain, flax, hemp, sugar-beets, potatoes, and fruit being grown. Much wheat is grown, though not nearly enough for the needs of the people, considerable quantities being imported from our country, while corn is also imported for cattle feed. The flax is the best in the world and there are no linens made elsewhere equal to those of the Belgian mills. The farms are very small, rarely more than two or three acres in size, and the spade largely takes the place of the plough in farm work. Thus they are handled like gardens instead of fields and yield abundantly.

The cattle and horses fed on the former sand barrens are of fine breeds, the Flemish horses being noted for their great size and strength. Many of them are brought to the United States for the use of the express companies. For the dairy products London is the chief market.

Metal Industries.—The coal area of Belgium stretches across the country and yields largely, while the iron ore lies only a few miles southward. The zinc mines on the eastern border are notably rich. The abundance of coal, with iron in its vicinity, makes this hill-region a very busy centre of manufacture, iron and steel wares being produced and also cotton, woollen, and linen goods. Other manufactures are of glass, porcelain and ordinary pottery. An important product of Belgium is handmade lace, the work of the Belgian women. It is of marked fineness and beauty and is sold at high prices in foreign lands.

Transportation.—The state owns and operates the Belgian railways and does this with such skill and judgment that they are handled profitably at low rates of fare. They are more closely distributed than in any other country in Europe, and as they are connected with the trunk lines of Germany and France their freight business is large. Canals are numerous and aid in the internal commerce of the country.

Commerce.—Belgium has a short coast-line, it being only about forty miles long, and has no ocean harbors. Antwerp, its great port, is on the river Scheldt, which makes its way through Holland to the sea, so that the Belgian trade has to pass through the waters of another country. Large ocean steamers can go up the Scheldt as far as Antwerp, and this city has an extensive trade. There are three other commercial cities, Ghent, Bruges and Brussels, which have ship-canals connecting them with the sea.

The imports of Belgium are chiefly food substances and raw materials of manufacture. From the United States it receives meat, corn, wheat, cotton and coal oil. The exports are linens, laces, porcelains, fire arms, and various others. Belgium controls the Congo Free State of Central Africa and obtains from it large quantities of rubber and ivory. Most of the rubber finds a market in the United States.

Centres of Industry.—Brussels is the capital and largest city. Its manufactures are mainly carriage- and lace-making. Brussels carpets, named from this city, have almost ceased to be made there and are now largely imitated in the United States and other countries. Antwerp, while one of the leading European ports, has also manufactures of shipbuilding, sugar refining, distilling and lace-making. There are various other manufacturing cities, the largest being Liege, noted for glass, cutlery and fire-arms, and Ghent, for linen and cotton goods and fine machinery.

THE NETHERLANDS.—North of Belgium, with which it was formerly united, lies the country of the Netherlands, or Holland, as it is most commonly called. Both these names mean "lowland," and this indicates the character of the country. The low plain of Belgium here slopes to a lower level, until much of the surface lies below the level of the ocean. The sea is kept from overflowing it in part by the dunes or hills of sand it has thrown up, and largely by dikes—great walls of earth and stone—which preserve the country from inundation. These need to be very strong, for in times of storm the ocean waves beat against them like mighty hammers. Some of the dikes are three hundred feet thick and thirty feet high. They follow the coast for sixteen hundred miles, and there are many smaller ones along the rivers to keep them from overflowing their banks. The great extent of these dikes show how diligently the Dutch have labored to keep out the ocean.

Canals.—No country in the world has so many canals. They extend in all directions like a great network, their main purpose being to drain the land, for the water is pumped from them and thrown into the rivers or the sea. Formerly these pumps were worked by windmills, which may be seen in all parts of Holland, but steam-pumps have been introduced and are now largely used. The canals are useful not only for drainage but also for transportation, freight barges traversing them in all directions. The canals connect with the rivers and are constantly in use, the Dutch, as the people of this country are usually called, using them in preference to coasting in the outer waters.

Holland has been largely built up by the river Rhine, which here divides into many channels, reaching the sea through what is called a delta. It has for centuries been carrying clay and sand from the Alps and depositing it along these branches, so that the country owes its existence in great part to this stream.

Agriculture.—A country like this, without minerals or metal products, its surface made up of alluvial soil, destitute of any natural source of power except that of the winds, inevitably turns to agriculture as its chief industry, and we find that most of the people of the Netherlands are engaged in farming and grazing, although their country has large infertile areas of sand and swamps. All the principal grains are grown, especially rye. The sugar-beet is also raised in large quantities, it proving profitable to devote the land to this crop and buy much of the wheat and rye needed from America and Russia. Truck farming is the method commonly pursued and the growing of flowers is an important industry, the flowers, bulbs, and vegetables finding a ready market abroad.

Stock-Raising.—More land is devoted to pasturage than to farming, much of the soil being too sandy for cultivation, while in the lowlands the abundant moisture causes a rich growth of grass. In consequence, cattle, horses, sheep and hogs are raised in large numbers and dairying is a leading industry. Butter and cheese are produced in great quantities and sent abroad, the small, round Edam cheeses of Holland being familiar objects in nearly all the large cities of Europe and America. The cattle kept are of the best breeds and many of them are fattened for the London market, while the United States is a large buyer of the horses and dairy cattle of the Netherlands.

Manufactures.—The lack of coal and iron stands in the way of manufacturing activity. Lumber is also lacking and the whole supply of coal, iron and lumber has to be brought from other countries. Yet the windmills used for pumping also supply power for grinding grain. The abundance of clay leads to the making of bricks and tiles, and there are cotton, woollen and linen mills, sugar refineries, and shops to work up the home and colonial crop of tobacco. Many of the people are engaged in the fisheries, cod, herring, and oysters being taken in large quantities.

Commerce.—The Dutch have long been a great seagoing people and at one time were one of the chief commercial nations of the earth. They are fortunate in possessing very valuable colonies in the East Indies, especially the rich islands of Java and Sumatra. The trade with these colonies is carried on in their own ships, their coffee, tobacco, spices and other products being brought to the home ports and thence distributed to other countries.

Not only does Holland benefit by the control of this colonial trade, but also by being so situated that it handles much of the trade of Northern and Central Europe. Lying in the path to this region, and traversed by the Rhine, which is navigable far into Germany, much of the American and British trade with Germany and part of that with Austria and Switzerland takes this route and benefits

Holland in its passage. The canals aid in this transit trade, the American coal oil, for instance, being loaded into tank-boats and taken through them to the neighboring countries.

Articles of Trade.—The exports of Holland are largely such farm products as butter, cheese, flax, flowers, sugar, vegetables, horses and cattle. The imports are food-stuffs, manufactured articles and raw material for the workshops. Much of the Sumatra tobacco, the Java coffee, and the sugar and spices of the Dutch East Indies reaches the United States, but it comes by way of Holland, which gets its profit on the transactions.

Centres of Industry.—Amsterdam is the constitutional capital of the Netherlands, though the royal family lives at The Hague. It is a large city of over half a million population and is one of the financial centres of Europe and an active centre of manufacture. Since the North Holland Canal was completed its trade has greatly increased, the largest sea-going vessels reaching its docks. An interesting industry of this city has long been diamond-cutting, but it has lost much of this to London.

Rotterdam is the most active of the commercial cities, having more than half the trade of the country. The deepening of the river and canals has made this one of the best ports of Europe, and its trade is growing with great rapidity. Delft is widely famous for its beautiful porcelains.

DENMARK.—This little kingdom, not much larger than our State of Maryland, is all that is left of a great kingdom of the past, that once spread widely over the north of Europe. It is now crowded into a small peninsula and some islands in the Baltic Sea. These islands are the most valuable part of the kingdom, and nearly fill up the space between the mainland of Denmark and the shores of Sweden.

Denmark is a country without hills, lying little above the sea level. It has no minerals and no important manufactures, the people mainly occupying themselves with dairying and farming. There are peat bogs and sand-dunes, the northwest part of the country being a sandy waste, but the surface is very largely under cultivation for pasturage, even the sand-dunes being converted into pasture fields.

Farm Crops.—The Danes rank with the ablest farmers and stock raisers in the world. No other country gets so much wheat out of an acre of ground; but the wheat-growing area is not large, the soil being needed for raising hay, oats and root crops for cattle-food and for the many horses, sheep and other animals kept. As in Belgium, the farms are very small, and each farmer tries to get the utmost out of his little patch of land.

Dairy Products.—It is in its dairy products that Denmark excels. No other people equal the Danes in this branch of industry. About half the soil of the state is devoted to the needs of cattle, sheep and horses, and the Government appoints inspectors whose duty it is to keep everything relating to dairying up to the highest state of efficiency. In this small country there are a million and a half dairy cows and nearly as many sheep, with many horses, goats and pigs.

The dairymen and farmers work in close co-operation. The pastures, fodder, cattle, creameries, etc., are all of the best, and the dairy products, butter in particular, are of the highest quality and find a steady market at good prices. Great Britain is the best customer for the Danish butter, buying large quantities of it each year. Of the food-producing industries, we should also speak of the fisheries, which are important, good fishing banks being near at hand.

Manufactures.—The manufactures of Denmark are largely confined to such articles as are needed by the

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THE BOURSE, COPENHAGEN, DENMARK.

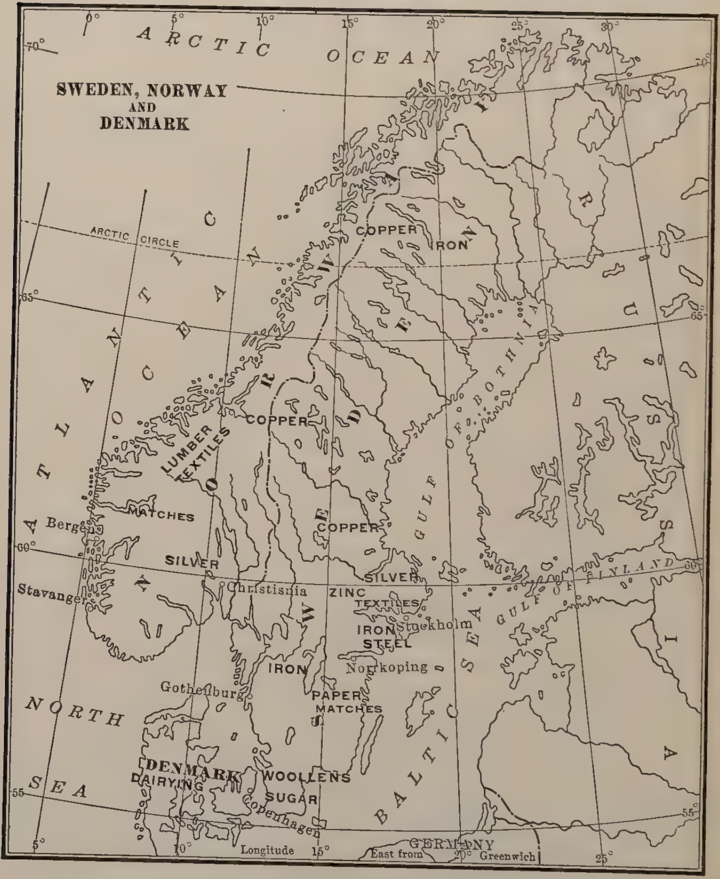
farmers. As there are no coal and no water power, they simply work up the products of the fields in flour mills, beet-sugar works, breweries, etc. Clay is the only useful mineral, and of this porcelain is made. Among the other industries are tanning, leather goods and sail cloth.

Colonial Products.—Denmark possesses several colonies, including Greenland, Iceland, the Faroe Islands, and some small islands in the West Indies. The latter produce sugar. From the others are obtained eiderdown, wool, furs, seal-oil, etc. The cryolite of Greenland, from which alum and soda are made, is the chief mineral.

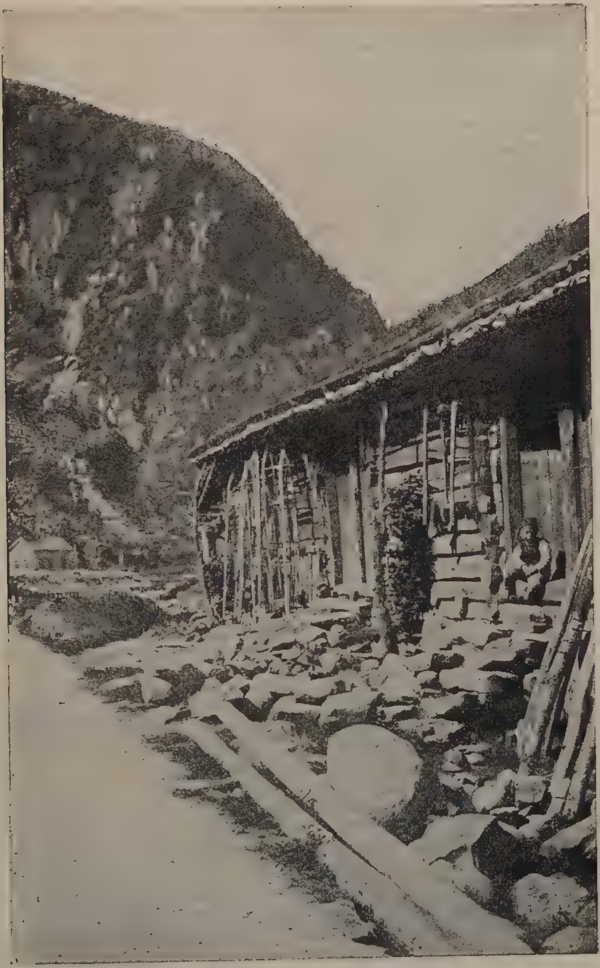
Commerce.—The exports of Denmark consist almost wholly of butter, eggs, meat, and live animals, about half of them being butter. England is the chief customer for these goods. All the lumber and coal needed has to be imported, the only native fuel being peat from the peat bogs. Other imports are hardware, machinery, breadstuffs, textiles and other manufactured goods, a considerable portion of which comes from the United States.

Cities.—Copenhagen, the capital, is a seaport of leading importance. It stands at the entrance to the Baltic Sea and is a great forwarding centre for goods consigned to Baltic ports. The cargoes are landed here, and are transferred to Baltic shipping, so that this port does an active trading business. Other commercial cities are Aalborg and Aarhuus, and Odense is a manufacturing centre.

SWEDEN AND NORWAY.—The kingdoms bearing these names occupy the large peninsula in the north of Europe, often spoken of as Scandinavia. This is an ancient name, which in past times also included Denmark and Iceland. Like the peninsula of Italy in the south, that of Scandinavia in the north is traversed by a back-bone of mountains. These begin in the Arctic region and stretch down to the Baltic Sea, so that the country is very rocky and rugged. Norway, which occupies the western half of the peninsula, is almost wholly a land of mountains, which here border the ocean. Sweden, which lies on the Baltic Sea, has a wider stretch of plain between the mountains and the sea. This becomes especially wide in the far south.



Agriculture.—Not only its ragged surface, but its cold climate, stands in the way of agriculture in this peninsula



Home of Peasants, Norway.

The only region in which farming thrives is the wide plain in the southern part of the country. Here are raised the grains native to the colder part of the temperate zone, including wheat, rye, oats, and barley. The sugar-beet also is grown. None of these, except oats, yields enough for the wants of the people and breadstuffs and sugar need to be imported.

In the same section of the peninsula are found the chief pasture lands, cattle being raised here in large numbers. Dairying is an active industry and much butter is sold to England. Sheep are also kept, but considerable wool has to be bought abroad, there being not enough home supply for the mills.

Forestry.—If we seek the most important gift of nature to these northern kingdoms, we find it in the extensive forests, which spread over the broad mountain regions and occupy a large section of the country. The trees are those of the far north, pine, spruce and fir, and make splendid lumber, the wood being specially valued for its hardness and toughness. This is a result of the shortness of the summer season, the trees growing slowly and adding a narrow ring of wood each year, so that the timber becomes close-grained.

The Scandinavian forests are the great source of lumber supply for Western Europe, which has been robbed of its timber by reckless wood-cutting in the past. Not only lumber, but turpentine, pitch, tar, and rosin are supplied by the pines of these prolific forests.

The Fisheries.—Another source of wealth to Norway and Sweden are the rich fishing grounds, which furnish great part of the food of the people. Everywhere along the coast food-fishes swarm, especially cod and herring. The cod fisheries are in the waters around the Lofoden Islands, in the Arctic Ocean. Here forty thousand people are employed during the season. The herrings swarm in vast multitudes farther south and are taken by millions. Many salmon and mackerel add to the supply and the annual fish harvest is an immense one.

Navigation.—The people of Norway have for ages been active fishers and sea rovers, and their love of the sea has made them the hardiest sailors in the world. Each family owns its fishing boat, the women working in their gardens or on the small farms while the men are at sea. Ship timber is so abundant that ship-building goes on actively, and Norway has the greatest number of freight vessels of any country in Europe except Great Britain. As their own commerce is too small to keep these employed, the mariners are largely engaged in the carrying trade of other countries.

Mining.—In addition to its lumber, Sweden has important mining interests, its iron ore being of the highest quality. There is no coal near the iron, and though some of the ore is smelted with charcoal, the most of it is shipped to Europe and the United States. Swedish iron has no equal in the making of steel and of wrought-iron of high grade and there is a large demand for it.

Manufactures.—Scandinavia has very little coal, but its many short mountain streams give it an abundance of water-power. This is now being used in the production of electric power and the manufactures are increasing, though they are not large. The great lumber supply leads to the making of wooden-wares and wood-pulp, and the matches of Sweden are used in all parts of the world. Cotton and woollen goods are woven in mills and linen fabrics are made on home looms, but in many respects the country fails to supply its own needs and has to obtain goods from abroad.

Commerce.—Sweden and Norway have little to sell abroad except lumber, fish and iron ore. Ice is also an article of export. They have to buy textiles, machinery,

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Busy Farmers in a Hillside Field, Above Are, Sweden.

steel and iron wares, and many other articles, so that there is a large balance of trade against them. To overcome this they have the money which their freight cruisers earn in other lands, also the cash left by the multitude of sight-seeing tourists who visit those countries every summer.

Cities.—Stockholm and Gothenburg are the chief cities of Sweden, both of them sea-ports. Much of the Scandinavian trade centres in Stockholm, while Gothenburg has a growing commerce. Its harbor is seldom frozen over, and it is connected with Stockholm by canal and lake navigation, also by railways. The principal city of Norway is Christiania, the capital, which is a large export market for fish and lumber products. Next in importance is Bergen, a manufacturing and commercial city, its principal exports being fish, fish-oil and roe, its imports being textiles, corn, sugar, tobacco, brandy, wine, etc.

CHAPTER XXVI.

THE EMPIRE OF RUSSIA.

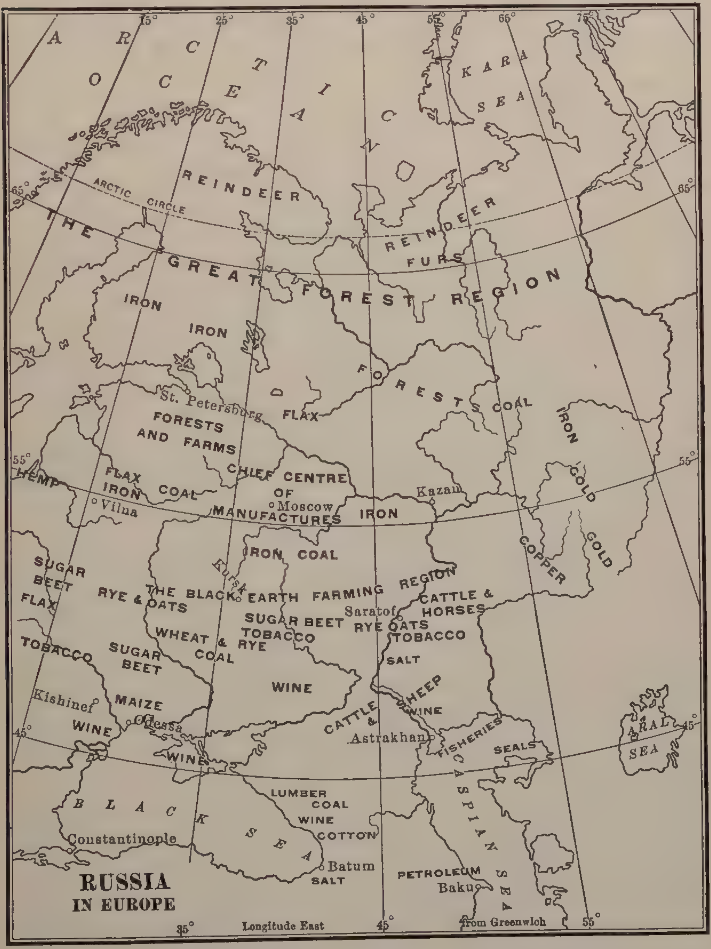
Area of Russia.—The greatest compact country on the face of the earth is the Empire of Russia. In Europe it comprises more than half the continent, and the total empire occupies about one-half of the great continental expanse of Eurasia—or Europe and Asia combined. In fact, more than one-seventh of the land surface of the earth is included within this giant empire.

The only country surpassing it in size is that often called the British Empire, consisting of Great Britain and its colonies. But these colonies are spread all over the earth, some of them being practically independent. These may throw off British control at any time, while Russia is a unit, with no colonies and no dividing barriers.

Surface Conditions.—Russia in Europe is in great part a broad level plain, its central divide being a low hilly region which at its highest point is less than twelve hundred feet above sea-level. There are high mountains in the Caucasus, but from the base of these mountains broad plains extend, in places below sea-level.

If we cross into Asia, over the low range of the Ural Mountains, we find this great plain to continue, extending through Siberia for several thousand miles to the Pacific Ocean, and from the Arctic Ocean to the borders of Persia. Nowhere else upon the earth is there so vast a tract under one political control and so devoid of mountains.

Climatic Conditions.—Yet large as Russia is, a great part of it is valueless, extending into those frozen regions of the Arctic zone where no food-plants will grow. Thus, north of the latitude of St. Petersburg the grains will not ripen on account of the severity of the climate, and the northern half of the great area of Siberia is incapable of food production.



But further south there is a large area of farming country, fertile and productive, and moderate in climate, the empire extending southward to the latitude of Italy. Here the summers are hot, but the rainfall during the season of growth is at times so small that the crops fail and famine results. Farther north the rivers and canals freeze in the long, cold winters and for months internal commerce by water is at an end. The great central belt of the country is covered with forests. South of this is the "black earth" belt, rich and productive, and yielding very large crops in the years of good rainfall.

Farmers at Work, Russia.

Agriculture.—Farming is the great industry of Russia. For home-use large quantities of rye and maize are grown, while wheat is the great export crop. The rye crop is the greatest raised in any country, and the wheat closely approaches in quantity that of the United States. Another large export product is flax, Russia raising four-fifths of the world's supply. Hemp is another valuable crop. Beet-sugar is produced in sufficient quantity to supply the home demand, tobacco is grown, and in the south grapes are raised and much wine made. Of the potato crop, a large part is used in distilling alcoholic spirits, of which the Russian peasants are far too fond, drunkenness being an almost universal evil.

A still larger farming district is that of southern Siberia, which has an immense stretch of land fitted for the cereals and well adapted to the growth of hard-grained wheat. Oats, rye and potatoes are among the other products. The farming lands here are being taken up and the product is annually increasing. In Turkestan, the region east of the Caspian Sea, most of the land is a sandy desert. But there are rich oases, irrigated from the rivers, and very productive. Cotton has been planted

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Jewish Market Place, Moscow.

here and is getting to be a large crop. It is shipped by rail to the cities of Russia and goes far to supply the Russian cotton mills.

Animals.—On the steppes of Russia, which resemble the grazing lands of our western plains, cattle, horses and sheep are raised in large numbers, being kept by the Cossack herdsmen, who live in tents and wander with their flocks and herds about these plains. The steppe region extends over a vast area in southern Siberia and horses, sheep and cattle feed over it in great herds, cattle being most numerous near the towns, where there is a demand for beef and dairy products.

Swine are raised in vast numbers and in the forests live a great variety of wild animals, many of them yielding valuable furs. These include wolves, squirrels, beavers, and many others, the cold regions of the far north being rich in fur-bearing animals.

Forests.—Russia possesses extensive forests, surpassed in area only by the timber belt of the United States. They extend over great part of Siberia north of the farming region. As yet the resources of these vast forests have been little developed, though there is a considerable export to Northern Europe. In Russia wood is the chief house-fuel and is also used to make steam in the factories, and in the form of charcoal for smelting iron ore, coal being usually too distant for profitable use.

Metals and Minerals.—Nature has supplied Russia with great wealth in the hills and mountains, especially coal and iron, there being an abundance of the latter, while there are several large coal fields, one near Moscow, another in the vicinity of Warsaw, and a third near the large iron industries on the lower Don River. The amount mined supplies four-fifths of the demand, and is annually increasing. But railways are needed to bring coal to many of the iron mines and replace wood in smelting the ore.

The Ural Mountains yield gold, silver, copper, platinum and graphite, also some precious stones. Gold is found in several parts of Siberia and copper is mined in the Caucasus Mountains. The annual gold product approaches $30,000,000, Russia ranking fourth among gold-yielding countries. Another mineral of great importance is petroleum, of which rich wells occur in the region around Baku, on the Caspian Sea. In this useful material Russia comes next to the United States. Most of the oil is used for fuel, though large quantities of it are refined into kerosene or burning oil.

Manufactures.—For a long time in the past Russia was very backward in manufacture, producing little except house-made goods, but in recent years the Government has made active efforts to develop a factory system like that of other lands. Much the greater part of Russian products are still fabricated in the home by rude, old-fashioned methods, but many factories have been established and several large manufacturing cities now exist.

Chief among these factory processes are distilling and brewing, the Russians being very fond of alcoholic liquors. There are also cotton and woollen factories, flour and sugar-refining mills. Steel-making has developed in the Ural Mountains and on the Don, the output being nearly sufficient to supply the railway demand, and farming implements are made in the grain-growing districts. Russia now makes all the textiles it needs and has some left over for export, and no country surpasses it in ropes and cordage or in leather.

The farming industry, however, predominates in Russia, most of the factory hands working only in the winter and going home to work on the farms in summer. Many work at home in the winter, making goods ordered by the manufacturers. Thus linen goods are produced at home all over the country. The market for Russian goods is within the empire or in the adjoining countries of Asia; they cannot compete elsewhere with the cheap goods of the West.

Transportation.—Russia is a land of long and sluggish rivers, flowing over its nearly level plain and forming an extensive system of waterways, with few falls or rapids. The Volga alone, with its tributaries, has over seven thousand miles, and the rivers and canals in all extend over nearly fifty thousand miles of navigable waters. Canals are easily excavated in that level country, and they connect

FLAILING GRAIN IN PEASANT COTTAGE, RUSSIA.

many of the streams, while the latter have been deepened to make them navigable. Passenger and freight boats ply all summer over this long stretch of internal water-way, and boats can make their way by several routes from the Baltic to the Black and Caspian Seas, and even from the Arctic Ocean to the Caspian Sea.

In winter ice closes these channels and then the value of the railways becomes apparent. Of the more than forty thousand miles of railways the State owns the chief part, including the great Transsiberian System with its six thousand miles of rail and the line from the Caspian through Turkestan. In the grain-growing districts there is a network of railways, aiding in the distribution of the products of the fields.

Fairs.—The canals and railways are useful in transporting the goods sold at the great annual fairs, which are held at Nijni-Novgorod, Kharkof, Kief, and other cities. These are ancient institutions, which are kept up still though they have lost much of their former importance. At the Nijni-Novgorod fair buyers and sellers gather from distant parts of the empire and the sales in a year may amount to more than $100,000,000.

Commerce.—Russia buys nearly as much from the West as it sells to that region, taking in supplies of raw materials, such as cotton, wool, metals, etc., and selling wheat, rye, flax and other surplus products of its fields. To Asia it sells manufactured goods and buys tea and other products from China. The Chinese goods are carried by caravan across Mongolia, reaching the railway at Irkutsk, on the Siberian frontier.

Centres of Industry.—Among the Russian centres of industry Moscow stands first. It is the railway centre of the State and occupies a location from which rivers, connected by canals, diverge in all directions. This has made it a focus of manufacture and trade. Warsaw comes next in importance as a centre of trade and Lodz as a manufacturing point. Baku is the petroleum market and Astrakhan is a great trading point for the country bordering on the Caspian Sea.

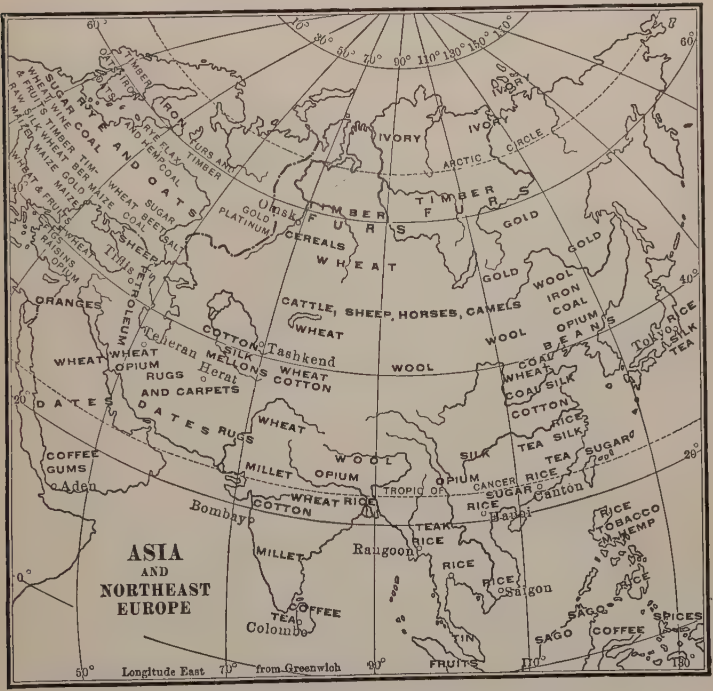
Seaports.—Russia has many seaports, but few of much commercial value. Her long seacoast on the Arctic Ocean is useless for commerce except from the port of Archangel, and this is blocked with ice for great part of the year. On the Baltic the chief port is St. Petersburg, the capital, which is connected with the sea by a ship canal and does a very large trade. It has also extensive manufactures. Another Baltic port is Riga, an active trading and manufacturing town.

Odessa, on the Black Sea, is the second port of the empire, having a large trade in grain and other products of the soil, and importing raw materials of varied kinds. Rostov is another grain market on this inland sea. On the Pacific coast Vladivostok is the great outlet to the ocean. Port Arthur, an ice-free port in the south, was lost as a result of the war with Japan, and Vladivostok is ice-bound during about three months of the year. It has, however, an active trade and some manufacturing interests.

CHAPTER XXVII.

CHINA AND JAPAN.

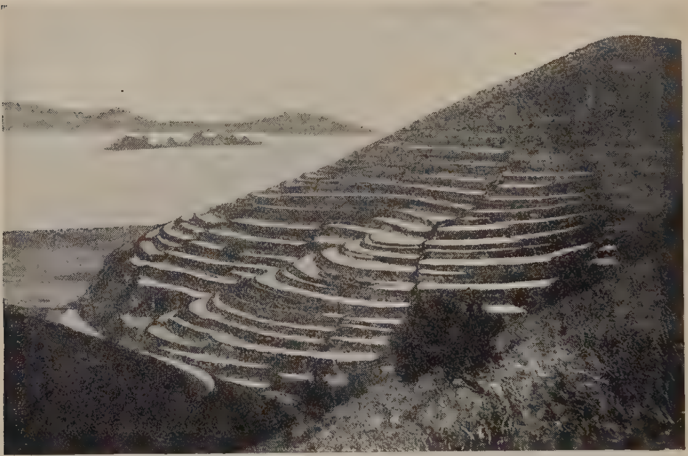
CHINA.—The most ancient of the world's empires and far the most populous, containing about one-fourth the population of the world, is the great empire of China, which occupies a position in Asia comparable with that of the United States in North America. Their range of latitude



MAP SHOWING THE LEADING PRODUCTS OF ASIA.

is much the same, and their mountainous, arid and fertile districts are in about the same proportion.

The empire comprises, in addition to the country usually known as China, the large districts of Mongolia, Manchuria, Tibet and eastern Turkestan. These districts are sparsely peopled, being in great part mountainous or arid, the vast bulk of the population being in China proper, which has about half the area of the United States, though it possesses four times as many inhabitants.



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ARTIFICIAL TERRACING TO MAKE STEEP HILLSIDES AVAILABLE FOR AGRICULTURE, CHINA.

Agriculture.—Farming is the great industry of the Chinese, the vast stretch of lowland in the east and southeast being exceedingly fertile and highly productive. In this region the great bulk of the population dwells.

There are no great plantations, as in our country, but a vast multitude of very small farms, a few acres each in size, and cultivated so carefully that the whole country looks like a great garden. The farming machines familiar to us are not used, there being no room for them and everything being done with the most primitive tools. Yet the ground is kept well fertilized and is cultivated so carefully that large crops are raised.

The Cereals.—The climate of China is not unlike that of the eastern United States and is adapted to much the same kind of plants, a large amount of wheat being grown, also maize, millet, and peas. But rice is the great crop and forms the food of all but the poorest people. The need of irrigation confines the rice crop mainly to the lowland region of the coast, though irrigation is practiced inland, the water being raised by wheels from the rivers. Few regions, however, raise enough for the needs of their population and much food is imported. This is largely due to the imperfect means of transportation, it being often cheaper to bring food-stuffs from distant countries than to transport them from one province to another.

The Chinese Tea Plant.

Tea and Silk.—Other leading products of China are tea and silk. Tea has long been looked upon as essentially belonging to China, but other countries have now come into active competition with it. Yet China still supplies about one-third of the world's tea, in addition to the amount consumed at home. As all the Chinese drink tea, this home consumption is great. A leading article of export is raw silk. The silk-worm is kept everywhere, the mulberry tree being grown in all directions to provide food for the worms, while the reeling of the silk from the cocoons is an ordinary household occupation. The great bulk of the product comes from the country along the upper Yangtse River and the regions west of Canton and south of Shanghai. Half the raw silk of the world is received from China, while a large part of the product is woven and used at home, silk clothing being commonly worn by well-to-do people. The weaving is done on hand-looms at home, though there are some silk mills near Canton and Shanghai in which the silk-weaving machinery of the West is used. No goods can exceed in beauty the silk embroideries of China.

Cotton.—Cotton is a very general crop in southern China, being grown as a garden plant, not on plantations as with us. It is very largely cultivated along the lower course of the Yangtse River and is spun and woven in the household on hand-looms. The cloth produced by no means equals the demand, as the people wear cotton clothing in summer and winter, so that large quantities have to be imported. Much raw cotton is also imported and woven in Chinese mills, of which many are now in operation, Shanghai being a centre of this industry.

Woodland and Pasture.—Forests have almost ceased to exist in China, they having been cut down, even in the mountain region, to extend the area of the farms, and to supply fuel. The effect has been to increase the arid area. Of the plants, the bamboo is the most useful, being employed for a great many purposes. The wax-tree supplies a wax, deposited by insects, which resembles beeswax and is used for similar purposes.

In the farming region of China few animals are to be seen, except poultry and swine. Chickens and ducks are kept in numbers and many eggs exported to Japan. The Chinese eat little meat, except pork, and have no room for pasture-fields. The cattle-herder must be sought in the arid regions and especially on the great plains of Mongolia, where cattle, sheep and horses are kept in large numbers. The donkey and the mule are in use to some extent as beasts of burden, and the camel is employed in the caravans that cross the Mongolian plains.

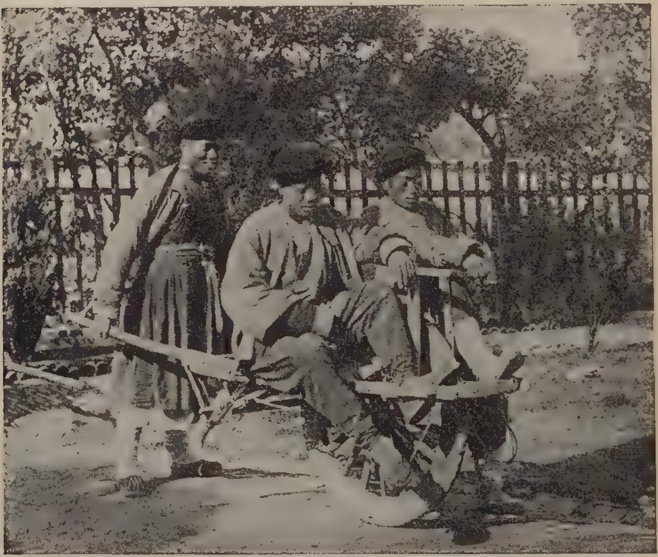
Mineral Products.—China is very rich in useful minerals, at least in coal and iron, the most useful of all. There is an immense abundance of coal, bituminous and anthracite alike. No one can say how much there is, as the mines have not been developed, but some think them the most extensive in the world, and the coal in North China has been estimated at 650,000,000,000 tons. Iron also exists in large deposits, some of it near the coal. This is the case in the northern province of Shansi, and also in Manchuria, where there are large iron deposits with good coal near at hand. Copper, lead, tin, silver and gold exist, but have been little worked.

Manufactures.—Aside from the home-made cotton and silk goods and the product of the few factories the manufactures of China are limited. The people are very primitive in all their methods and are just beginning to make use of modern machinery. Porcelain-making is one of the oldest industries and fine earthenware has become so associated in our minds with this country that we still speak of it as "China," even when it is made in our own land. The country is rich in fine clays and the people are remarkably expert in the manufacture and decoration of porcelain.

Other products are mattings, fans, bamboo, paper, carved and lacquered ware, and fire-crackers, which are an active home industry. Chinese "crackers" are known in all parts of the world.

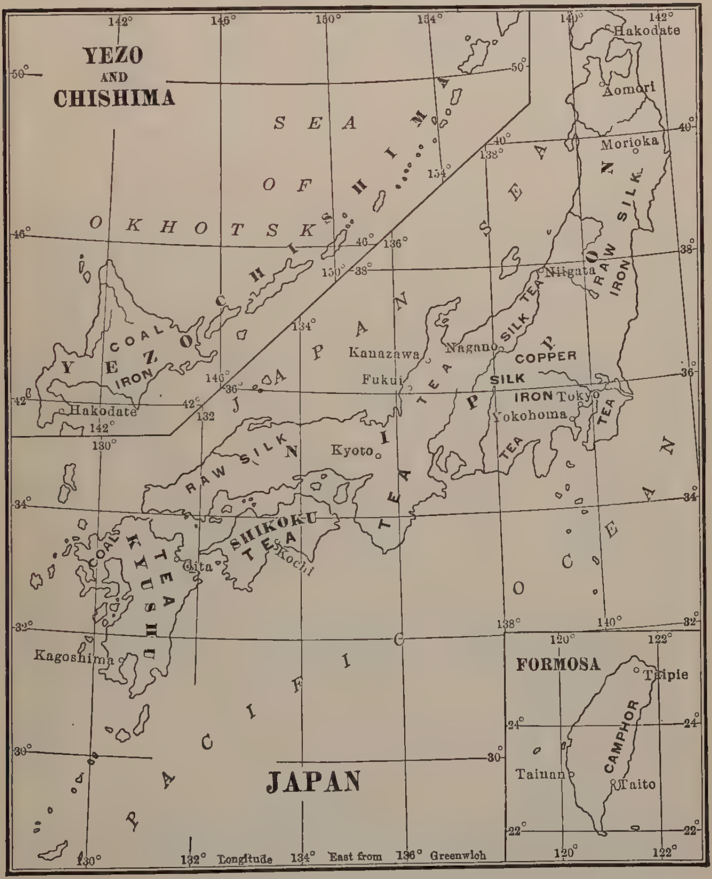
Transportation and Commerce.—China is just beginning to introduce the railway and its chief channels of transportation are still the rivers and canals. The Yangtse

River is a splendid commercial stream, up which ocean steamers can go for six hundred miles and river steamboats five hundred miles farther, while the native boats can ascend another five hundred miles. The Hoang-ho, while shallow, is navigable for the boats of the natives, and in the south the Sikiang is navigable into the rich country back of Canton. There are also numerous canals, of which the Grand Canal, seven hundred miles long, is the longest in existence.



Passenger Wheelbarrow, China.

Aside from these waterways and the few hundred miles of railway, the means of transportation are poor, the roads being miserable and traffic greatly contracted. Much of the internal transportation of goods is done by means of the wheelbarrow, which may be seen everywhere on roads and in streets, laden with goods or passengers. As a result, the trade of the more inland provinces is small. Tibet sends skins, wool, and musk to China, and Mongolia supplies the camels for the caravan trade with Russia, much tea being sent in this way. Manchuria is a good grazing and farming region and sends grain and meat to China.



Foreign commerce is handled chiefly at the ports of Tien-tsing, Shanghai and Canton; tea, raw silk, silk-goods, porcelain, etc., being exported, while the imports include cotton goods, rice, flour, opium, kerosene, silk, metals, and iron wares. (Hongkong, a British seaport on the Chinese coast, controls nearly half the foreign trade.)

JAPAN.—In considering China, we have had to deal with an Asiatic country which is just beginning to emerge from the manners and customs of a thousand years ago. In the neighboring empire of Japan, on the contrary, we have before us a country which has recently adopted many of the ways of the Western nations and has got rid of most of its ancient customs.

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CLEANING THE RICE PLANT BY FLAILING, JAPAN.

Like China, Japan has a crowded population. The islands which make up the empire do not exceed the State of California in area, while their population is more than half that of all the United States. Yet, by intensive cultivation, they grow most of the food they need and have some left over for export.

Agriculture.—Rice is the great food crop of Japan, it being grown on the lowlands of the coast and so carefully cultivated that it yields a product of very fine quality. A great part of this is sold abroad, as too valuable to be eaten at home, and an inferior Chinese rice is imported for food purposes. Wheat and other cereals are grown to some extent, the soil being tilled in some cases to the mountain tops. The refuse material of the fisheries is used to fertilize the farms.

The most important commercial product is tea, which is cultivated in many parts of the country and sold in great part to the United States. Green tea, the variety preferred in this country, is the chief kind made, and as it is of a fine quality and carefully packed for the American market, it commands a good price. Formosa tea is looked upon as the best, but Japanese tea in general is esteemed.

Some cotton is grown, but much needs to be imported to supply the Japanese cotton mills. Raw silk is also largely produced. It is of superior quality, being surpassed only by that of China, and is largely woven on household looms. That exported is mainly used in making ribbons and brocades.

Animals.—Very little attention is paid to pasturage in Japan, as the people eat scarcely any animal food except fish, and the few oxen and buffaloes kept are used for draught purposes. Cows for dairy products are a recent introduction, and sheep are not needed, as the people do not wear woollen clothing. Nearly the only flesh food which meets with favor is that of pork, and swine are becoming numerous throughout the country.

But the chief form of animal food in Japan is that of fish, which swarm in vast numbers in the warm waters surrounding the islands and give employment to a multitude of fishermen. Myriads of salmon, herring, perch and many other varieties of fish are caught; oysters of a peculiar and delicious kind are abundant and form almost the sole food of many of the natives around Tokio, where the oyster fisheries chiefly lie.

Forestry.—Though Japan has forest trees in great variety, there is a lack of good building lumber and a considerable quantity of this material is imported from our Pacific coast. Yet bamboo is plentiful, and in the flimsy wooden houses of Japan much of this is used for building purposes. Among the plants grown for industrial uses may be named the mulberry, on which the silkworm is fed and from the bark and young twigs of which paper is made; the vegetable wax-tree; and the lacquer-tree, the sap of which yields the most durable varnish known. Wood treated with this has a very hard and waterproof surface, and the lacquered ware of Japan finds a wide market in the West. One of the most valuable plants is the camphor-tree, which is cultivated in the island of Kiushiu and grows abundantly in Formosa, which is now the main source of the commercial camphor of the world.

Minerals.—The mountains of Japan yield a variety of mineral products, and within late years efforts have been made to develop the mines, especially those of coal and copper. Japan possesses the richest copper mines in Asia and these are being actively worked, some of the metal being exported and more used in making the artistic bronzes of the empire. Coal also occurs in many localities, and is being largely used in the manufactories of the islands, but not largely for iron smelting, since there is little ore, and much iron and steel need to be purchased abroad. Other minerals are petroleum, which is important, and gold, silver, lead, etc., which are less important in yield. Sulphur exists in vast supply and of the utmost purity.

Manufactures.—Since Japan has swung into the circle of modern nations, its people have shown remarkable productive industry. Not content to purchase manufactured goods abroad, they have founded a factory system of their own, introduced the best modern machinery, and are seeking to make for themselves all articles needed.

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Making Rice-Straw Mat, Japan.

As the people nearly all wear cotton goods, the cotton mill has been introduced and considerably more than a million spindles are kept busy. Textile manufactures occupy more than a million of the people, many of them working on home-looms in the production of cotton and silk goods. Another active product is straw matting, which is exported in large quantities and may be seen on many of the floors of America and Europe. These are a few only of the very numerous products of the Japanese workshops, the people being so intelligent and enterprising that they are building even their own ocean steamers and steel-clad battleships. When it is considered that Japan retained its ancient methods until less than fifty years ago, this great progress is very remarkable.

Transportation and Commerce.—Japan has introduced the most modern means of transportation, including excellent highways, more than five thousand miles of railway, and telegraph, telephone and postal service in all directions. As no part of the country is very far from the ocean, its ports are easily reached, while there is a large mercantile marine owned by the Japanese, and also native steamship lines to the United States, Australia, China and elsewhere.

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BALING WHITENED RICE, JAPAN.

The foreign trade is large and steadily increasing, amounting to over $400,000,000, of which $100,000,000 is with the United States. Three-fourths of this consist of Japanese exports to this country, mainly raw silk and tea. The cotton goods made in Japan find a considerable market in China and other countries of Asia. The imports from this country consist of kerosene, leather, tobacco, lumber, etc., while textiles, machinery and hardware come largely from Great Britain and Germany.

Yokohama is the chief port for the American and European trade, other important seaports being Nagasaki, which has a fine harbor and is an important coal market, and Kobe, the outlet for the rich products of central Japan. Hakodate, on Yezo Island, has a growing trade in coal and fish, and Osaka and Kioto are the chief centres of textile manufactures.

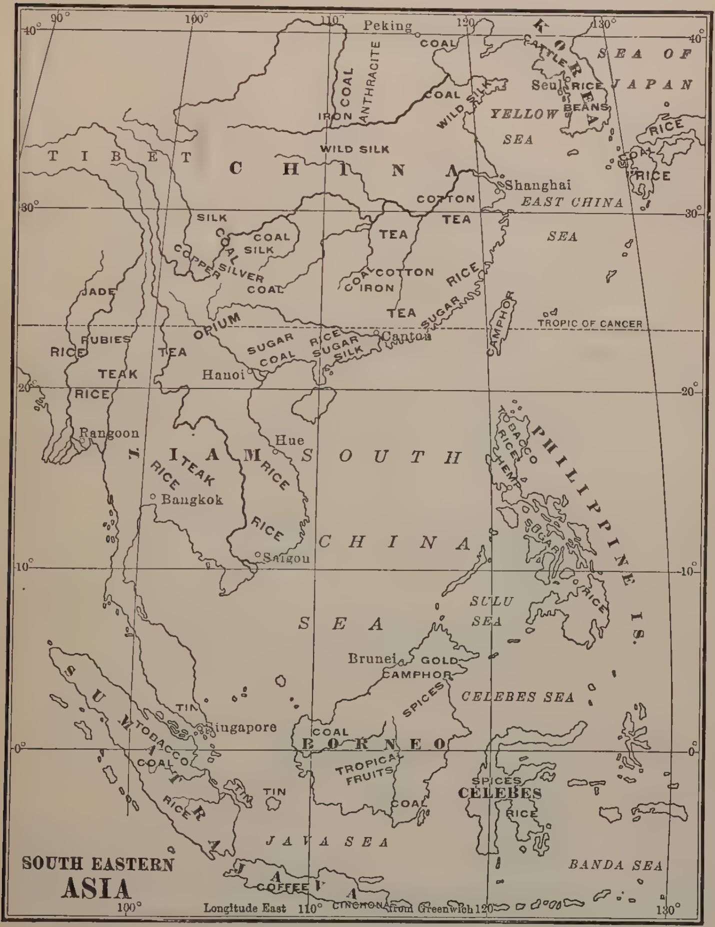
CHAPTER XXVIII.

SOUTHERN ASIA.

Southern Asiatic Countries.—The countries of Southern Asia comprise the great plateau region extending from the Mediterranean through Asiatic Turkey, Persia, Afghanistan and the Cashmere region of India to the Himalaya Mountains, and the three large peninsulas of Arabia, India and Indo-China, which extend southward into the Indian Ocean. Of these the plateau and the Arabian peninsula are of little industrial and commercial value, while India is a country of great interest and importance.

Persia.—Of the plateau countries named, Persia stands economically at the head, and this especially for its silk and wool products, the silk being woven into brocades, the wool into the famous Persian carpets and rugs. In countries in which the houses have no floors, the rug or carpet becomes a necessity, and the making of these by Oriental weavers has grown from an industry into an art that gives their products a high value in Western lands. In the manufacture of the Persian rugs the finest wool is used, not only that from the best grades of sheep, but the choicest parts of their fleece. These are colored with dyes not easily imitated and woven with designs and patterns of unique character, the results being remarkable for durability and artistic finish.

Rugs are made in all these plateau countries, but those of Persia are the finest. They are gathered by caravans and find their way to the Mediterranean sea-ports, whence they are sent to Europe and the United States. A good market, at high prices, is assured. Farther east in the plateau region is the native State of Cashmere, where are made the famous Cashmere shawls. These are a cottage product, woven from the fine hair, white to brown in color, of the goats of that region.



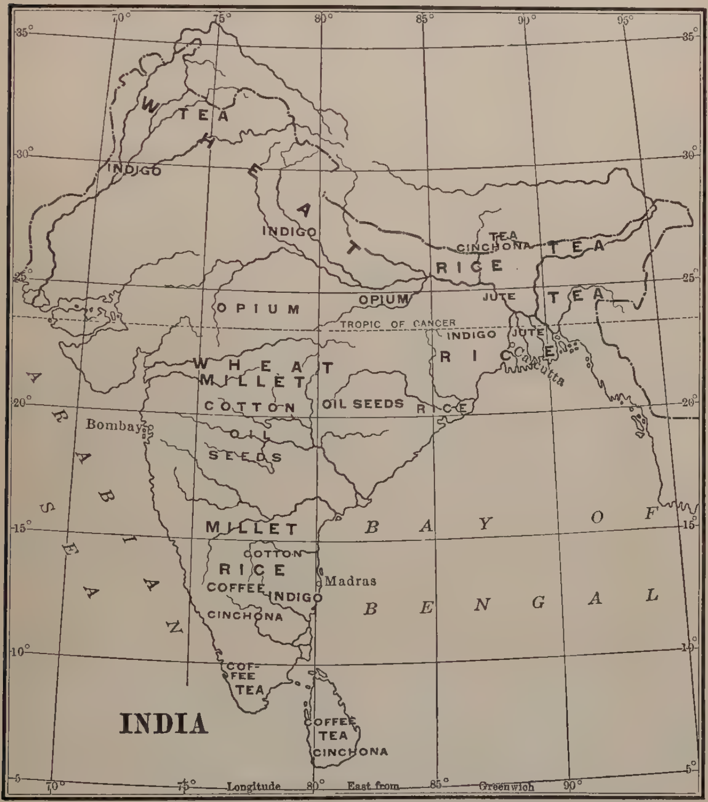
Persia is of little importance otherwise to the industrial world. Food enough is grown for the needs of the people.

Its ancient mines of silver, copper, lead and iron are no longer worked; its imports are textiles, sugar, kerosene, etc., and its exports, in addition to rugs, include tobacco, opium and fruits. Silk and wool are the most important products, and the pearl fisheries in the Persian Gulf have long been famous. Bushire and Bender-Abbas are the seaports and the Russian trade centers in Trebizond.

Weaving an Oriental Rug.

Arabia is of no commercial importance, beyond its export of Mocha coffee and hides, and Afghanistan is similiarly non-important, receiving only a few British goods and exporting rugs, made here or received from Khiva and Bokhara. The same may be said of Beluchistan, the only articles of commerce being the carpets and tent covers made in the cottages of its uncivilized inhabitants.

India.—The great peninsula of India, or Hindustan, as it is often called, has long been famous in the history of commerce. A thousand years ago it was known to the people of Europe as the source of the fine silks, muslins, shawls, spices and pearls which were brought by caravans to the ports of the Mediterranean and Black Seas and distributed through Europe by the vessels of Venice and Genoa.



So highly were these fine wares esteemed by the Europeans of that time that when the conquering Turks cut off this caravan trade strong efforts were made to reach India by other routes. This gave the impulse to the voyages of the Portuguese around Africa and of Columbus across the Atlantic. The latter, to the day of his death, supposed he had reached India and did not know he had discovered a new continent. Since those days India has sunk in esteem, the western nations having learned the art of making fine goods for themselves. Yet it continues in many respects important.

India is a country half the size of the United States, but with three times its population, it being one of the most thickly peopled regions of the world. It lies in great part in the torrid zone, being bounded on the north by the lofty Himalaya and Hindu-Kush Mountains, and extending southward in high plains and low, rolling land with very rich soil. Great part of the country is under the rule of Great Britain and those parts which are under native government are largely controlled by the British authorities.

Agriculture.—India is very largely an agricultural country, more than three-fourths of its people being engaged in the culture of the soil; rice, maize, and millet being grown for the food of the people, wheat largely for export. As the climate varies from the chill of the mountain regions to the tropical heat of the lowlands, a large variety of plants can be grown, the farm crops including, besides the grains, cotton, tobacco, sugar, coffee, tea, ginger, and spices in general.

Rice is the great food crop of the warm lowlands, millet of the drier uplands, no millet and little rice being exported. Of late years much attention has been paid to wheat, which can be raised cheaply and has become one of the great articles of export, India now standing fourth in rank among the wheat-growing countries. The greatest export crop is cotton, the growth of which has been developed until India now produces more than a million bales annually and stands second to the United States. There are many mills making cotton yarn which is sold to the countries of Asia, and cloth which is sold to Africa, but most of the crop is shipped to England and made into cloth, much of it to be shipped back to India.

Jute is another fibre plant which is largely grown, some of the fibre being made into rugs and grain sacks, but a great part of it sent to Dundee, Scotland, where it is woven into carpets and other textile fabrics, including prayer rugs for the Moslems of the East. Another crop of leading importance is tea, in the output of which India has become the first country in the world, surpassing China both in quantity and quality of product. It is grown in the northeast province of Assam and in the island of Ceylon, in the far south, and finds its chief market in Great Britain.

A Buffalo Cart.

Silk is an industry of growing importance, the cocoons of the wild silkworm being gathered and woven into rugs of a beauty nowhere else equalled. Wool is also woven into rugs in the mountain regions. The poppy is largely grown and opium made from it, to be sold in China for the opium smokers of that country.

Woods, Metals and Animals.—The forests which in primeval times covered the country are now found only on the hills and mountains and many of these have been recklessly robbed of their woodlands. At present, however, the British are seeking to preserve the forests, of which there remain about 100,000 square miles.

The gold mines of old were long ago worked out and those of diamonds and other precious stones yield very poorly, but there is considerable coal, mines of which are now being worked to supply the railways. Copper and iron mines are also worked, but not to any large extent.

As the Hindoos do not eat meat, and as little of the land can be spared for pasturage, not much attention is paid to cattle-raising, cows being kept only for dairy purposes, and oxen and buffaloes for field work. Sheep and goats are abundant, being raised for their wool, and swine are kept in large numbers, though only for the lower classes of the people.

Manufactures.—As in Eastern countries generally, the manufactures are largely restricted to the household, there being home-made goods of many kinds. These include silk and woollen fabrics, metal work artistically wrought, fine weapons, wood and ivory carvings, and other articles, in making which the Hindoo craftsmen are very expert, their products being highly admired. A few centuries ago this custom of house-work was common all over the world, and still persists in parts of Europe, though elsewhere driven out by factory-work. The British are introducing the latter into India, and now there are cotton, woollen and flour mills, tanneries, iron works, etc.

Commerce.—The internal commerce of India is conducted by means of the rivers and canals and the many railways now in use, also along the roads by aid of elephants and camels, and of wagons drawn by zebus, the humped oxen of the East. The foreign trade goes through the seaports of Bombay, Calcutta, Madras and Karachi, which are connected with Europe by various steamship lines. The exports are largely of raw materials, such as cotton, jute, hides, tea, opium and indigo, while cotton yarns and cloth are also exported. The imports are of manufactured goods, including textiles, metal wares and many other materials. Among the manufacturing cities Bombay stands first, cotton goods being largely made there. The manufacture of jute goods has been established at Calcutta. Another centre of cotton manufacture is Ahmedabad, as also of silk goods, pottery, paper, and metal work. Amritsar, in the Punjab, manufactures shawls, silk rugs and carpets, many of these being sold in the United States at prices ranging from a few hundred to several thousand dollars.

INDO-CHINA.—East of India and separated from it by the Bay of Bengal lies the peninsula of Indo-China. Of this country Great Britain now controls Burma in the northwest and also much of the western and southern coast, while France has seized nearly all the remainder of the country, the only native State left being Siam, which lies between the holdings of these two land-hungry nations.

British Burma is now a part of British India, and is almost wholly agricultural, its upland fields growing wheat, its lowlands yielding rice. The latter forms a large product and furnishes the chief export of the country. The teak forests of this country yield fine ship timber, and a large shipbuilding industry has grown up in the seaport of Rangoon. Mandalay, a river port, is another centre of commerce.

In the south of the peninsula are what are called the Straits Settlements, so called because they face on the Straits of Malacca. The chief of the colonies thus known are Singapore, Penang, and Malacca, each with a seaport of the same name. The chief of these is Singapore, which is one of the leading seaports of the East and does a very large business. The most important of its exports is tin, which occurs largely in Malacca and the neighboring island of Banca and is smelted at Singapore, which has the largest tin-smelting works in the world. Large quantities of spices are shipped from this port, and also rubber, gutta-percha, rattan and tapioca. The imports are rice, opium and cotton goods, which are the universal dress fabric of the peninsula.

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PREPARING CINNAMON FOR USE.

SIAM.—The native State of Siam has been reduced in size by French and British aggression until little remains but the valley of the Menam River. Its products are principally rice and teak-timber. The latter finds a market in Europe, while much of the rice is sold to neighboring countries. Other exports are pepper and preserved fish. Bangkok, at the mouth of the Menam, being the trade centre.

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WOMAN PLUCKING COFFEE.

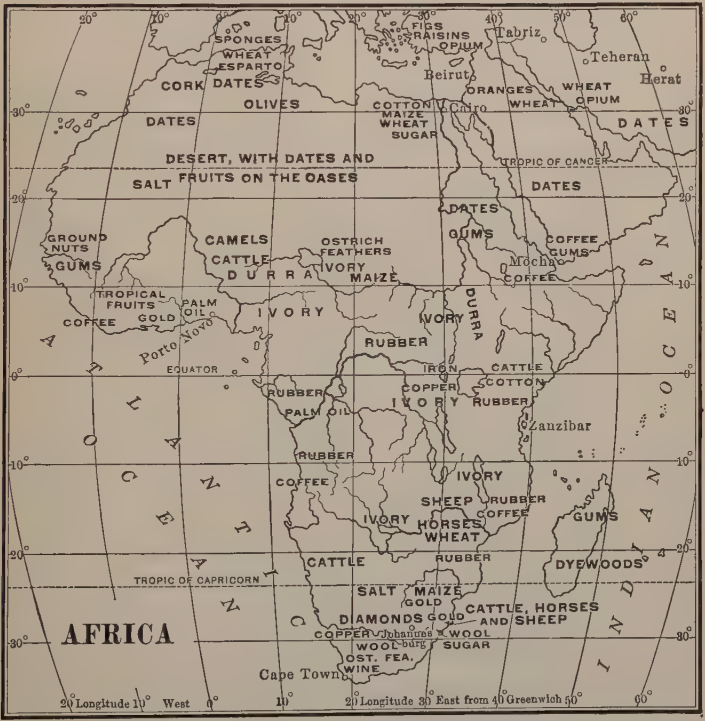
FRENCH EAST INDIA.—France holds all the eastern part of the peninsula from China southward, including the old countries of Cochin-China, Cambodia, Annam and Tonkin. Rice is the great product, and is shipped in large quantities to Singapore and Hongkong as trading centres. The shipments foot up more than half a million tons. Another important product is pepper. Textiles, kerosene and machinery are the principal imports, the machinery being used in recently introduced cotton and silk mills. The growth of these industries is due to the presence of cheaply mined coal.

DUTCH EAST INDIA.—Holland has large and valuable possessions in the seas south of Asia, including the large islands of Java and Sumatra, most of the small islands, and a large part of New Guinea. Their principal products are sugar, coffee, rice, tobacco, tea, indigo, gutta-percha, pepper and other spices. Coffee is a large product of Java and Sumatra and is of fine quality. Java produces considerable tea, and Sumatra tobacco is highly esteemed for cigar wrappers. The cultivation of Peruvian bark has also proved successful. Java is surpassed only by Cuba in its cane-sugar crop. The other islands are often called the Spice Islands, from the various spices they produce.

CHAPTER XXIX.

AFRICA.

Conditions in Africa.—Africa, the second of the continents in size and population, is the smallest of them in industrial and commercial importance. This is due, not to lack of natural wealth, but to lack of development of this wealth. In the hands of savage and half-civilized



Map showing the leading Products of Africa.

peoples for ages, and open to civilized methods for less than half a century, it is just beginning to show its capabilities of production, and is destined in the future to become a prominent agent in the progress of the world.

North African States—Northern Africa consists of a narrow strip of fertile land along the Mediterranean, which is separated from Central Africa by a vast desert, the Sahara. This reaches the sea east of Tripoli, and would extend unbroken to the Red Sea but for the fact that it is traversed by a great river, the Nile, the fertile borders of which constitute the land of Egypt. In addition to Egypt, this northern region contains the French colonies of Algeria and Tunis, the Turkish province of Tripoli—largely desert—and the Moorish nation of Morocco, the last remnant of the once great Arabian Empire in this region.

Tangier Custom House.

Production of the Soil.—These Moorish countries, the Barbary States as they were formerly called, are semi-tropical in climate and fertile in soil, producing the ordinary grains, and also the olive, date, grape and other fruits. These are largely exported, while Algeria sends out much wine, which is sold as French wine. It also exports much cork, the cork oak flourishing here. Date palms grow profusely in the oases of the desert and are largely shipped to Europe and America. Sponges are another important export. Esparto grass, for making paper, was once much cultivated, but the use of wood-pulp for paper has cut off much of the demand and the grass lands are used for grazing, this causing an increase in the wool-clip. Morocco exports in addition beans, almonds, and goatskins. These skins are tanned with sumac and form the famous Morocco leather, much used in book-binding. But very little of the leather now known by this name is genuine.

The Caravan Trade.—The Saharan Desert, while mainly a sandy waste, contains many fertile spots, or oases, on which the date palm flourishes luxuriantly, while it is crossed by caravans of camels bringing the products of the great region south of the desert. These consist of ostrich-plumes, gums, ivory, and other tropical products, cotton goods, fire-arms, and other Northern wares being returned. The city of Tripoli, the centre of this trade, receives many thousands of camel loads yearly, the trade being principally in the hands of Arabs.

EGYPT.—The famous old Kingdom of Egypt was confined to the narrow area on each side of the Nile which the waters of the river covered in its annual overflow. The country being rainless, all beyond this contracted strip is a desert. Yet the land is so fertile and so carefully cultivated that large crops are grown and the country has long sustained a large population. In the north, from Cairo to the Mediterranean, the fertile area grows much wider, the Nile dividing into many channels which reach the sea along a wide strip of coast. This region is known as the Delta. To add to the farming area the British, who now control Egypt, have built two dams across the Nile, at Assiut and Assuan, the latter an immense one, capable of storing water enough to irrigate twenty-five hundred square miles of land.

Agricultural Products.—The Egyptians are an agricultural people, rice being grown for the food of the people, and wheat, maize, and beans for export, the last being used in Europe for horse-food. Sugar-cane is grown, the sugar being refined in Europe, and cotton is an abundant and valuable product, it yielding a long fibre which rivals the American "sea island" cotton. Much of it is imported to this country and used in the thread and hoisery mills. Another export to the United States is of onions grown in the valley of the Nile.

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THE GREAT IRRIGATING DAM AT ASSUAN, EGYPT.

Egypt has no woodland and no minerals and needs to import all the coal, iron and timber demanded. Its chief manufactured export consists of Egyptian cigarettes. These are made of the high-grade Turkish tobacco, that grown along the Nile being inferior in quality. Alexandria is the commercial port of the country, Cairo being the capital. Its northeast section is traversed by the Suez Canal, at the ends of which have grown up the cities of Port Said and Suez.

The Ship of the Desert and its Passengers.

The Soudan.—South of the Sahara lies a broad, grassy plain known as the Soudan, stretching across Africa and the seat of various former African and Arab nations. The principal part of it is now claimed by France and Great

Britain, while much of the eastern section is included in modern Egypt. The only independent nation at present is Liberia, a negro state founded on the western coast by the United States. At present the Soudan is of little commercial importance, its chief trade being that which crosses the desert in caravans.

ABYSSINIA.—East of the Egyptian Soudan is the native State of Abyssinia, a country in a condition of semi-barbarism and of little importance commercially. It produces gold and iron, possesses pasture lands and forests, and ships ivory, coffee and gold to India in exchange for textiles. Some cotton is grown and woven, but there is little manufacturing or commercial activity.

TROPICAL AFRICA.—The region of Africa stretching for ten degrees on each side of the equator is divided on the coast between England, France, Germany and Portugal, while in its interior lies the great area of the Congo Free State, under the control of Belgium. It possesses immense forests which may at some time become of great value to the world and which yield at present palm-oil, rubber, ebony, cam-wood—a rich red dye—and other products. The Congo State, traversed by thousands of miles of navigable waters in the Congo and its many affluents, yields rubber and ivory in large quantities. The natives of the African tropics live mainly on the banana, yam, manioc, and poultry and need so little of European goods that commerce with them is very small.

The most important development is in British East Africa and German East Africa, fertile and valuable plains which are susceptible of profitable cultivation. British East Africa is traversed by a railway from Mombasa to the Victoria Nyanza and contains many British and Boer settlers who are rapidly developing the country. It is a high plateau and capable of growing both temperate and tropical plants. German East Africa also has many plantations for the growth of similar products. Both these regions, though in the central tropics, are elevated and of agreeable temperature and promise to become a white man's country.

South Africa.—The section of Africa south of 10° S. latitude is one of the most interesting portions of the continent. Portugal and Germany hold large tracts of territory on the west and Portugal another large tract on the east coast, but the whole central and southern portion, much the largest and most important, is under the control of Great Britain and has been developed until it yields a large and valuable product, far surpassing that of German and Portuguese South Africa. To the old Cape Colony and Natal colonies have been added by conquest the Boer Transvaal and Orange River settlements, while to these have been joined the great interior district of Rhodesia, extending northward to the borders of the Congo Free State. The whole forms an extensive region, with large natural resources.

Plant and Animal Culture.—While much of this country is deficient in rainfall, there is an extended arable district on which wheat, maize and other cereals are raised. Sugar-cane is grown in Natal. Much fruit also is produced, especially the grape, which is grown over thousands of acres. Many of the grapes are sent to England in cold storage, while very large quantities of wine are produced. It is of excellent quality and commands a ready sale.

The drier parts of the country are devoted to pasturage, the Boers raising cattle in great numbers and the coast settlers also keeping large herds. Sheep and angora goats are kept in still larger numbers, wool being the leading export product, especially the Mohair wool of the goats, which is of exceptionally fine quality. Next to the wool export is that of ostrich plumes, the profitable business of ostrich farming being pursued by several large companies.

Several hundred thousand birds are kept on these farms, each yielding annually about a pound of feathers, of which the ordinary kind bring from five to ten dollars a pound. Choice plumes, however, are much more valuable, some of them selling as high as two hundred dollars a pound. Ostrich farming has been introduced

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INTERIOR OF DIAMOND MINE, KIMBERLEY, SOUTH AFRICA.

into British East Africa and Algeria and has been tried with success in California.

Gold and Diamonds.—The most valuable products of British South Africa are gold and diamonds, in the production of which this country surpasses any other part of the earth. The gold mines of the Transvaal have yielded more than $166,000,000 in a single year, while the yield of the United States, which comes next, was less than $100,000,000 in the same year. In regard to diamonds, South Africa stands in a class by itself, the diamond mines around Kimberley yielding ninety-eight per cent. of all the diamonds now in the world's market. Most of these are held back, so that the market shall not be oversupplied and the price caused to fall. Farther north, in Rhodesia and in the bordering district of the Congo Free State, copper is said to occur in vast quantities, the ore exposed being estimated to be worth $1,000,000,000. There are also said to

Sorting Gravel for Diamonds.

be rich tin deposits, with iron, lead and zinc, and Natal has productive coal mines, so that South Africa is of high promise as a mineral region.

Transportation.—As yet the lack of transportation facilities have hindered the development of the great copper deposits, the ordinary method of transporting goods being the slow Boer one of trekking with ox-wagons. But a railway from Capetown has penetrated this country and now extends 1800 miles north, crossing the Zambesi River above the Victoria Falls on a great bridge. There are branch roads to the coast and the facilities for commerce have been largely increased. This road is part of the projected Cape to Cairo Railway, of which 1200 miles have been built in Egypt from Cairo to Khartum, making 3000 miles now completed.

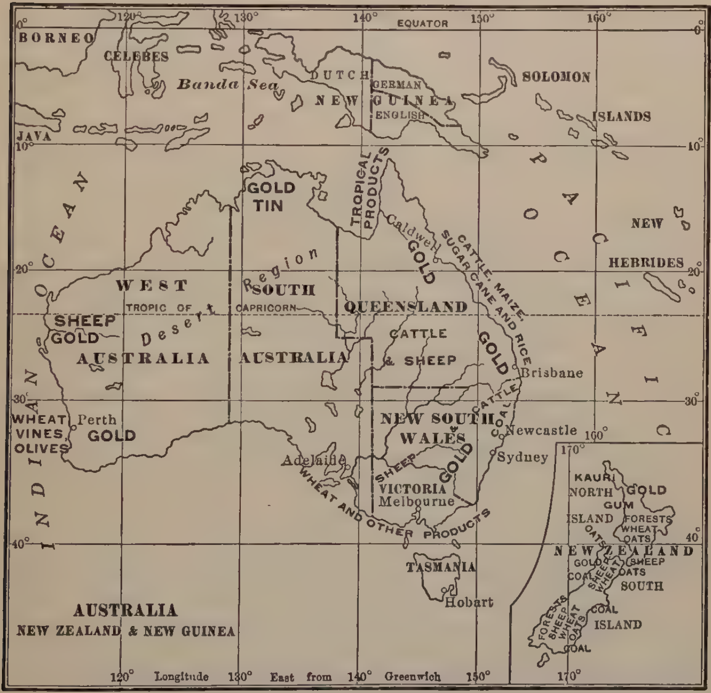
Commerce.—South Africa has few manufactures, its exports being restricted to raw materials, while its imports are largely finished goods. Textiles are sent from Great Britain and wheat, flour, machinery, hardware, lumber and other things from the United States. Timber being scarce, a large lumber import is necessary.

The chief trading seaport is Cape Town, other ports of importance being Port Elizabeth and Durban, the port of Natal. Johannesburg, the city of the gold mining region, has a population of 160,000 and is next to Cairo the leading city in Africa. Kimberley is the city of the diamond mine district.

CHAPTER XXX.

AUSTRALASIA.

South Pacific Islands.—Australasia is a word signifying Southern Asia, but geographically it is applied to the islands of the South Pacific, including the continental island of Australia, the large islands of New Guinea and New Zealand, and the smaller islands of that ocean south of the equator, some of the more important among them being the Fiji and the Samoan Islands, New Caledonia and Tahiti.



The most important products of these smaller islands are the cocoanut, banana, bread-fruit and sago-palm. The natives live on the fruit of these and export large quanities of copra, the broken and dried kernel of the cocoanut. Sago is also exported. As for the banana, it is estimated that the land which would support one person on fresh meat, forty-two on wheat, and one hundred and seventy on potatoes or rice, would support nearly six thousand on bananas. And as these grow with no great labor or care the natives have little hard work to do.

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COCOANUT GROVE.

Some of these islands yield other exports, such as sugar from the Fiji Islands, pineapples and limes from the Samoan group, sugar and mother of pearl from Tahiti, and iron, copper, nickel and cobalt from New Caledonia. New Guinea, an island larger than the State of Texas, and divided between British, German, and Dutch owners, yields coffee, rice, and tobacco and has large grazing areas.

AUSTRALIA.—Dominant in the South Pacific is the Commonwealth of Australia, occupying an island so large that it is usually classed among the continents. Its area, in fact, is about equal to that of the United States, exclusive of Alaska. Yet the population of this vast territory is less than that of our one city of New York. This is due to the fact that the whole immense interior of the country is a waterless wilderness, much of it incapable of supporting any kind of life.

This desert and arid region extends nearly to the coast on the west, there being only a narrow strip fit for human habitation. In the east and southeast there is a much larger rainfall, extending to a considerable distance inland, and here are the principal areas of settlement, including the States of Queensland, New South Wales and Victoria. South Australia, which crosses the central region of the island from north to south, and West Australia, which occupies its western third, are very largely desert regions, containing little arable land. The Commonwealth of Australia includes also the small island of Tasmania, lying south of Victoria.

Animal Products.—Of the habitable section of Australia a considerable part is too arid for profitable farming and is devoted to grazing, there being a very large grass-covered region inland from the eastern coast on which many millions of sheep are fed, with cattle and horses in much smaller numbers. Sheep form one of the great sources of Australian wealth, the wool-clip being immense, double that of either the United States, Russia or Argentina and nearly one-third the total product of the world. Much of it is merino, and of very fine quality.

In addition to wool, the mutton of the sheep is now shipped to England in great quantities in cold storage.

The transportation being almost wholly by water, the frozen mutton can be delivered in London at less than four cents a pound. Frozen beef is also sent and large numbers of frozen rabbits. These creatures, introduced in the last century, increased enormously and became so destructive to the grazing fields that efforts for their destruction have long been made. Many of them are utilized as above stated. In Victoria the dairying industry has been greatly developed, much of the butter produced being shipped to England.

Agriculture.—Australia, lying between 10° and 40° south latitude, is capable of producing most of the useful plants of the torrid and temperate zones. In the north, which here is the tropic and semi-tropic region, cotton does well, while in tropical North Queensland bananas are raised in very great numbers for the Southern Australian markets. Sugar-cane and maize also thrive in this region.

In the cooler southern section of New South Wales and in Victoria wheat is the chief farming crop. It is also produced largely in the arable section of South Australia. Another large crop is the grape, which is grown over thousands of acres in Victoria and New South Wales and is converted into raisins and wine, both of which sell well in Great Britain. Australian claret wine competes strongly with the claret of California. Another introduced crop is the potato, which yields abundantly. But severe droughts, often of long duration, interfere greatly with Australian agriculture, and irrigation is being introduced wherever available.

Forestry.—Australia is well forested, but its native timber, while durable, is too hard for ordinary building lumber, and the necessary supply of this is brought, in great part, from Washington, Oregon and British Columbia. The most valuable of the hardwoods is the jarrah, or Swan River mahogany, which is so hard as to resist the ravages of the white ants and the marine borers, and is much used for railroad ties, also, in connection with karri-wood, for street paving blocks. Much of it is exported for this purpose.

Mineral Products.—Australia is rich in gold, the development of which had much to do with the early settlement of the country. It is widely distributed, the principal mines being in Victoria, New South Wales and Queensland until those of Western Australia were developed after 1890. This country now stands third in gold production, being surpassed only by South Africa and the United States. Other metals include the extensive beds of iron ore in New South Wales, the abundant coal deposits of this colony and Queensland, the rich mines of copper in South Australia, of tin in Queensland and Tasmania, and of silver in New South Wales.

Commerce.—The railways of Australia are about fifteen thousand miles in length, the disadvantage being that each State of the Commonwealth has its special gauge, so that passengers and freight need to be transferred at the frontiers. They were built by private corporations, but have been purchased by the Government, with much improvement in the service.

The manufacturing industries of the Australian cities are growing, but large supplies of manufactured goods need to be imported, while the exports are chiefly of food-stuffs and raw materials. Wool, cattle products and coal are sent to the United States, which returns rail and building steel, tobacco, printing paper and coal oil. Other important imports are tea, coffee, and sugar.

Centres of Trade.—Melbourne, with about 500,000 population, and Sydney, nearly as large, are the leading cities. They are both seaports, but Sydney commands the bulk of the ocean trade. Brisbane, the port of Queensland, has a good trade in coal and wool. Adelaide is the port of

South Australia, Perth of Western Australia, and Hobart of Tasmania, each with a good share of the ocean trade.

New Zealand.—The group of islands under this name, lying in the Pacific southeast of Australia, is one of marked prosperity and industrially is the most advanced of the British colonies. As in Australia, sheep-raising is the most active industry, many cattle also being raised. Of these nearly all the products are exported, wool in particular.

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Gold Dredge, Buller River, New Zealand.

Butter and cheese of excellent quality are made and shipped in enormous quantity and frozen mutton and beef are very large exports, the New Zealand mutton being highly esteemed in England. Co-operative dairying is pursued, much to the advantage in quality of the products.

Wheat and oats are the leading farm crops and New Zealand flax, a kind of hemp, yields a useful fibre. Another native product is the Kauri-pine, which yields excellent timber and a gum that makes a varnish nearly equal to the Japanese lacquer. It is obtained both from the tree and in the fossil state.

Gold worth about $5,000,000 annually is mined, and also silver and coal, though not enough of the latter for home-use, the considerable production of woollen goods, shoes, furniture, flour and other fabrics creating a demand for fuel.

Wellington and Auckland are the principal seaports, and Dunedin, in South Island, the chief manufacturing city, Port Chalmers being its seaport. Christchurch, the second largest city, stands in the largest farming and sheep-raising district, Lyttleton being its port.

New Guinea.—The large island of New Guinea, though it has been divided up between the British, Germans and Dutch, has as yet little industrial or commercial importance and much of the interior remains unknown. It yields gold, pearl-shells and copra, also tobacco, sago, areca, ebony, bamboo and other woods, but so far its commerce is small. The remaining islands of the Australasian group, including Tasmania, the Fiji and Society islands, and various others, are claimed by European nations and are of some degree of value, as producers of vegetable products, though with most of them the expense about equals the profit.

CHAPTER XXXI.

MIGRATIONS OF MANKIND.

Human Migrations.—In concluding this work it is well to say something of a commerce of another kind than that of the movement of goods from place to place. The commerce in man, the movement of men from place to place, is even more important. We do not refer to the warlike migrations of the past, by which great empires were overthrown and the world kept in turmoil for centuries, but to the peaceful migrations of modern times, by which the area of civilization has been enormously expanded.

The settlement of America is the most important of these modern migrations. It was not exactly a peaceful movement, for the native inhabitants bitterly resisted the invasion of their territory and were subdued only after many years of war. This migration differed in one significant way from those of old. Most of the older ones were invasions of civilized lands by barbarian tribes, and as a result barbarism for a time replaced civilization. In the modern instance civilization replaced barbarism, the vast area of America being settled by civilized whites in place of its native population, which varied from the savages of great part of the continent to the partly civilized nations of Mexico and Peru. The result has been a vast extension of the area of civilization. The American continent a little over four centuries ago did not contain a single man coming up to our standard of civilization. There now dwell upon it 160,000,000 of civilized inhabitants, one-tenth the population of the world, while the numbers of the natives have not greatly decreased.

English-Speaking Peoples.—This is the most remarkable event in the history of the outspread of civilization.

There have been migrations in other directions, but with no result to compare with this. In Australia, a country as large as the United States, there are less than four millions of whites, and in Africa less than one million. An interesting fact in this connection is in the great development of English-speaking peoples. These increased from 20,500,000 in 1800 to 130,000,000 in 1900. Next in number were the Russians and Germans, those speaking Russian increasing from 30,700,000 to 85,000,000, and those speaking German from 30,300,000 to 84,000,000.

This great development of English-speaking peoples is largely the result of the rapid growth of population in the United States. It does not signify an equal increase of the people of British descent, for the people of this country, though adopting English as their language, have come from all parts of Europe, with many from Africa, and a small number from Asia.

Immigration.—The outflow from Europe to the United States has of late years increased enormously. Never before has any country been so rapidly peopled, either by warlike or by peaceful migration. The invasions of the past from Asia over Europe and the south of Asia, vast as they seem in historic estimates, were of minor dimensions as compared with this quiet and peaceful inflow to our country. Even the vast army which Xerxes led to the invasion of Greece, estimated at over a million of people, sinks into the background before this army of immigrants, which in three recent years, 1905–6–7, amounted to 3,413,000 persons.

These came from all parts of the world, the great multitude of them from Italy, Austria and Russia, but thousands from every other country of Europe, and numbers from Asia, Africa and the adjoining countries of America, so that the United States is being peopled, with unprecedented rapidity, from all the world, and its people are becoming a conglomerate of all mankind, in which are mingled men of all colors, white, black, yellow and red. The great bulk of them, however, are of the white race and little amalgamation with the other races is taking place.

This record of immigration, as we have said, has no parallel elsewhere. In fact, there is nothing to compare with it. Emigrants are making their way from Europe to Africa, to Australia, to Argentina and other countries in South America, but in tens where thousands seek this country. The only country with which a balance of inflow and outflow into and from the United States exists is Canada, the western wheat-lands of which country have recently attracted many thousands of farmer emigrants from the United States, more than sufficient to equal the immigration of Canadians to this country.

Movements of Mankind.—This peaceful movement of people over the earth, and especially that toward the United States, is one of the most remarkable events in all history. In the first decade of the twentieth century the inflow numbered more than 8,000,000, surpassing the populations of a score and more of the smaller nations of the earth. But the statistics of emigration fail to tell the whole story of the movements of mankind. We must add to the numbers of permanent seekers of new homes in foreign lands those of travellers, either for pleasure or business, whose number is of rapidly increasing greatness, and adds largely to the total of those who are going to and fro upon the earth. Aside from foreign travel is the vast sum of internal travel, in which a far greater multitude are engaged. Thus the people of the world we live in are constantly darting back and forth, like the threads in a great loom, in which is being woven the web of modern civilization.

Distribution of Migrants.—If it be asked where all these people dwell, and what leads to their varied distribution, it can only be said that this depends upon the conditions of the soil and climate and the opportunities for agriculture, manufacture and trade. Thus they are far from evenly distributed. The great cities attract the vast multitude of them, and for this reason the leading seaports and the inland commercial cities of the United States are growing with unexampled rapidity. Thus New York has developed until to-day it is the second city in the world in population, and in some senses is the first city in the world in business activity. But its population is so largely of foreign birth that it is in great measure a foreign city. Something of the same kind may be said of our other large cities. But the remarkable fact is the rapidity with which these immigrants are being amalgamated and converted into Americans in thought, habits, and language.

Others of the immigrants seek the hills under which coal and iron are hidden and form busy and useful communities of miners. Thousands of others take part in the building of railroads and in the great enterprises of bridge building, tunnel-excavating, steel-making and other industries demanding strong and willing labor, so that to the sturdy immigrant much of the rapid material progress of this country is due. The farm absorbs others of them, so that hitherto the United States has been capable of usefully absorbing the millions of recent immigrants that have sought its shores.

Centres of Population.—The population of this country, as of all lands, is very unevenly distributed, millions in some localities crowding within a few square miles, thousands elsewhere spreading over hundreds of square miles, and in places, hundreds over thousands of square miles.

This uneven distribution is due to causes partly natural, partly artificial. Thus in the western part of our country are vast arid districts in which Nature seems to forbid the presence of man. No food-plants will grow in their waterless soil and the farmer turns in despair from their barren fields.

The State of Nevada is one of these, but the discovery of rich deposits of silver in its mountains has brought it a population which must be fed by food from distant farms. The same may be said of Colorado and Arizona, rich in minerals, but poor in arable land. But in parts of these and other arid States, irrigation has brought farming communities and added largely to the population. Another state, Utah, in the arid district, became years ago the home of a religious community, the Mormons, who made its barren soil fertile by irrigation and developed a thriving commonwealth.

From the arid we may turn to the semi-arid territory of the great western plains, unfit for farming, yet covered with nutritive grasses suitable for the feeding of enormous herds of food-animals. Here we find thinly peopled districts, for we are in the region of the partly-nomad cowboy. Cattle and sheep have long been the chief population of these plains, few people were needed, and the home did not grow up. Recently, however, the farm has been invading the plains of the West and the wild life of the ranch promises to disappear.

Coming eastward, we enter upon the vast and fertile prairie region, the broad basin of the Mississippi and its tributaries, a realm of rich soil in which a thriving community of farmers has naturally developed, who for many years past have fed much of the world by their labors. In the southern portion of this basin we reach the land of cotton, also thickly peopled, its workers, in turn, helping to clothe the world by their labors.

The conditions here spoken of in the United States apply to all the world, for everywhere we find similar circumstances affecting the distribution of population and making it here very thin, there very dense. There are other things which have to do with the growth of communities. Thus the occurrence of coal and iron close together is apt to give rise to flourishing industrial communities. Sites where cheap power may be had are very likely to attract population. It was the abundant water-power of New England which at an early date made it a thickly settled region and gave rise to many manufacturing cities.

Coal in time took the place of water and led labor to new sites. In our days electricity is replacing both of these and enabling the industries to be spread over a much wider area. Finally we may again refer to commerce, the influence of our river, lake and sea-ports as centres for the gathering of men into great communities.

Our country was at one time in great part a farming one and the people were spread out widely over the land. Then manufacturing developed, and they began to concentrate into cities. Commerce was added to manufacture and the cities grew in size, until to-day more than one-third of all our people dwell in cities and towns.

It may be of interest to trace the growth of city population. In 1790 the dwellers in towns formed 3.4 per cent. of the total population of the United States. In 1820 they had grown to 4.9 per cent.; in 1850 to 12.5 per cent.; in 1860 to 16.1 per cent.; in 1890 to 29.1 per cent., and in 1900 to 31.1 per cent. This has been a rapid rate of progress, showing the change in occupations of the people and the power of the farmer to feed a constantly growing urban population.

Manufactures and Commerce.—This gathering of people into centres is going on all over the world, and is due to two causes, one of these being the development of manufactures, the other the development of commerce. The United States for a long time paid special attention to the first of these, its commerce being largely internal, while world-commerce was left mainly to other nations. Of late years it has given much attention to world-commerce and has grown to be one of the leading commercial nations of the world.

Great Britain has long stood first among these, but the United States and Germany are becoming its rivals. While the total commerce of Great Britain amounts to nearly $5,000,000,000, that of Germany is about $3,500,000,000, and that of the United States about $3,000,000,000. France follows with over $2,000,000,000, and the Netherlands with nearly as much.

If now we consider exports alone, we find the United States rising to a higher rank. While Great Britain's annual exports are valued at about $1,800,000,000, those of the United States are over $1,700,000,000, and those of Germany over $1,600,000,000. In both Great Britain and Germany the imports exceed the exports, in the former by about $1,000,000,000, showing that they depend in part on other countries for the necessaries of life and industry.

In the United States the imports were recently about $600,000,000 less than the exports, showing a very large balance of trade in our favor, and that we were able at once to provide for our own wants and to supply other peoples with many of the necessaries of life. But much of this large export was of food stuffs, and is falling off as we consume more of our food at home.

The greatest seaports of the world are the following: New York, with over 20,000,000 tons of commerce yearly; London, with nearly 19,000,000 tons; Antwerp, Hong Kong, and Hamburg, each with nearly the same as London; Liverpool, Rotterdam, and Shanghai, with about 14,000,000 tons each, and Singapore, with 12,000,000 tons.

Statistics of Production.—The leading nations of the world in production of food-stuffs are the following: The United States leads in corn and wheat; Russia in rye and oats; India in rice; Germany in sugar; China in tea; and Brazil in coffee and cocoa.

Aside from food-stuffs the United States ranks first in cotton, tobacco, coal, petroleum, iron, steel and copper;

Australia in wool; China in silk; South Africa in gold; Mexico in silver, and Malaysia in tin.

The United States stands second in gold, silver and oats; Mexico in copper; Great Britain in coal; Germany in iron, steel and rye; Russia in petroleum and wheat; Argentina in wool; Japan in silk; India in cotton, tobacco, and tea; China in rice; Bolivia in tin, and Austria-Hungary in corn.

These comparative figures are of course always subject to change, but they represent the status of the commerce and production of the nations at the present time. The most interesting fact in them is the leading position taken by the United States in many of these particulars. There have been changes in the past, as there will be in the future. For instance, South Africa has ~~gone far~~ beyond the United States in gold production and Russia approaches it in petroleum. As regards coal, China may perhaps in the future surpass all other countries. But in certain lines of production and commerce the United States now holds, and will probably long hold supremacy among the nations of the world.

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